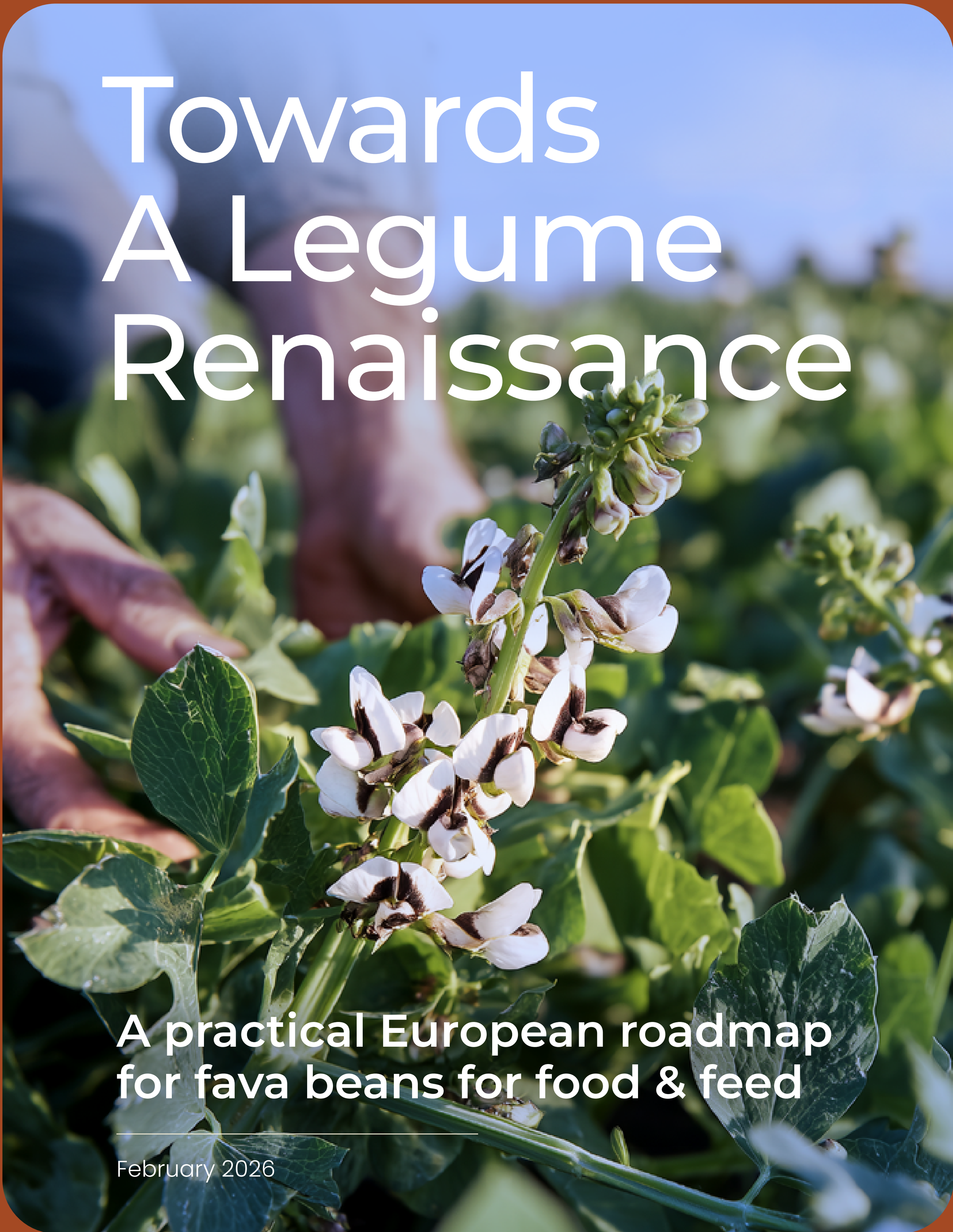
The Protein Project

Unlocking the untapped opportunities of legumes
to boost the European protein sector



Towards A Legume Renaissance

A practical European roadmap for fava beans for food & feed

February 2026

This report examines what would be required to scale the cultivation, processing, distribution and consumption of fava beans, using them as an exemplar for how greater strategic focus could be placed on the legume sector more generally within EU agriculture.

The analysis is intended to inform current policy discussions, such as the upcoming comprehensive EU protein strategy, at a time when concerns about the resilience, sustainability and performance of the European protein system are becoming more acute. It also highlights priority actions for the private sector to help unlock sector growth.

Fava beans were selected as the focus of this sectoral roadmap because they perform strongly across several criteria that are central to protein policy objectives. They are well suited to a wide range of European agro-climatic conditions and can be integrated into existing crop rotations. They offer well documented nutritional benefits for human diets, including high protein content and favourable micronutrient profiles. They are suitable for both food and feed uses, allowing flexibility in market outlets and reducing competition between these uses. While still underdeveloped, the value chain is sufficiently mature to allow relatively rapid scaling where incentives are aligned, including breeding, aggregation, processing and product development. Their environmental performance is favourable, notably through biological nitrogen fixation, reduced dependence on synthetic fertilisers, and positive effects on soil and biodiversity.

Despite these advantages, fava beans remain a minor crop in most Member States. This status is associated with low levels of research and breeding investment, yield variability, limited profitability, weak downstream demand, and thin and fragmented markets. These factors reinforce one another, resulting in low and volatile production and limited incentives for farmers and other value chain actors to commit to the crop. At the same time, the EU protein system faces several structural risks that strengthen the case for diversification, including dependence on imported protein feed, growing public health concerns linked to dietary patterns, mounting environmental and climate pressures, and persistently low and volatile farm incomes in many regions.

Against this background, the report presents fava beans as a credible source of plant protein for both food and feed, with the potential to contribute to strategic autonomy, environmental objectives, and greater resilience at farm and system level. However, realising this potential requires more than isolated interventions. Sector development depends on coordinated action across the value chain, supported by a policy environment that strengthens the farmer business case while also enabling investment in processing, product innovation, logistics and market development.

The report therefore serves four purposes. First, it assesses the potential role that fava beans and, by extension, other legumes could play in European food and feed markets. Second, it identifies the technical, economic and organisational barriers that currently constrain sector growth. Third, it outlines policy and coordination mechanisms that could help align incentives across production, processing and consumption, recognising that supply, markets and demand must be developed simultaneously. Fourth, it gives clarity on the economic potential of fava bean rotations for farmers and on the impact of a production and consumption increase on the EU's strategic autonomy. In this way, the roadmap makes a strong case to support more coherent and effective approaches to protein diversification within the EU.

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Executive summary

Europe's food system confronts four interconnected crises: declining strategic autonomy, rising health burdens, environmental degradation and persistently low farm incomes. Our growing dependence on imported protein and fertilisers leaves us vulnerable to geopolitical volatility. Diet-related diseases impose mounting healthcare costs while intensive agricultural practices degrade soil, reduce biodiversity, and drive carbon emissions. At the same time, many farmers struggle to make a decent living, with narrow margins and high volatility. The European Union cannot address these challenges through business as usual. Systemic transformation is required—one that restores profitability, resilience, and health to our farms and communities.

Legumes can address these four crises, and fava beans show particular promise as a catalyst. Fava beans are Europe's oldest cultivated legume and part of our shared food heritage—trusted by Charlemagne, who mandated their cultivation across his empire—yet their potential has been largely overlooked in recent decades. These versatile crops serve both food and feed markets. As protein crops, they strengthen strategic autonomy by fixing nitrogen in the soil, reducing the need for chemical inputs and providing high-quality local proteins for feed. They strengthen public health through fibre-rich, nutritious protein for food. They regenerate soils, reduce emissions, and restore biodiversity, addressing environmental degradation. Finally, they can strengthen farmer income through diversified rotations and higher-margin production—as demonstrated by innovative farmers across the EU who have built profitable businesses around fava beans.

Despite substantial growth over the past 60 years in the EU, fava beans' potential remains largely untapped, stuck in the downward spiral of a minor crop. Fava beans face underinvestment, fragmented markets, underexplored processing, and insufficient demand. These constraints create a vicious cycle where low profitability discourages farmers from scaling production, which in turn limits investment in infrastructure and market development. Breaking this cycle requires coordinated action across the entire value chain.

This sectoral roadmap charts a path to develop a competitive fava bean sector that supports all actors across the value chain. It was developed with 20 value chain actors and 60+ experts. Overall, it identifies key challenges and the structural solutions needed to support the development of the value chain (see page 4). Crucially, it links these to policy recommendations in key files such as the CAP, CMO, NRP, Competitiveness Fund, Horizon Europe, etc. It then quantifies the impact of these solutions on farmer income (Figure 1), total production (Figure 2), and the EU's strategic priorities—autonomy, health, and environment (Figure 3).

Key Challenges

Research & innovation

Limited progression in the development of new inputs

Lack of research on usage impacts as feed

Farming

Insufficient revenues from primary production, especially for the production of dried fava beans

Transition risks

Insufficient additional revenue streams

Transformation

Challenging investment and business case

Harvest variability & limited regulatory guidance

Market

Limited integration in food products and services

Limited direct adoption by consumers

Limited coordination between actors and data visibility

Strategic Outcomes

1 Production Toolbox

Farmers have the seeds, inputs, tools and knowledge to reach target yields and quality of fava beans in different production methods

2 Farmer Support

European farmers are supported to start cultivating legumes, and rewarded for the resulting societal benefits

3 Value Chain Coordination

Value chains across the EU are strongly coordinated, and fava bean farmers are well organised and effectively supported for production, processing, and contracting

4 Enabling Regulations

Clear and enabling EU regulations on the usage of fava beans in food and feed support a wide versatility of use

5 Processing & Infrastructure

Storage, distribution and processing infrastructure in the EU is well developed around key clusters of production, strengthening rural development

6 Market Development & Access

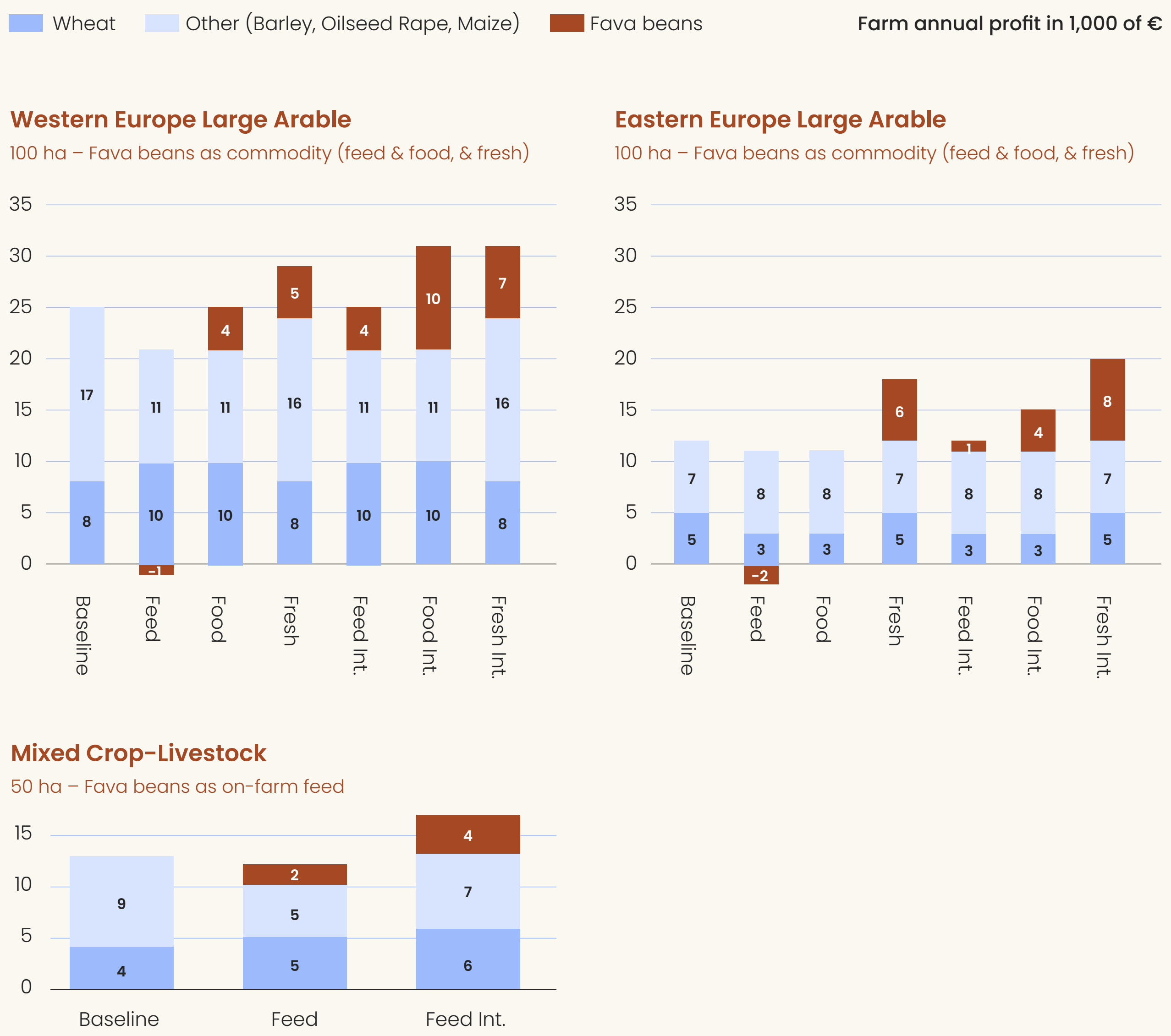
Public and private actors offer healthy, tasty and sustainable food options, leading to a high share of fava beans in European diets

7 Consumer Adoption & Demand

Fava beans are an easy, affordable and appealing choice for European consumers, backed by supportive dietary guidelines

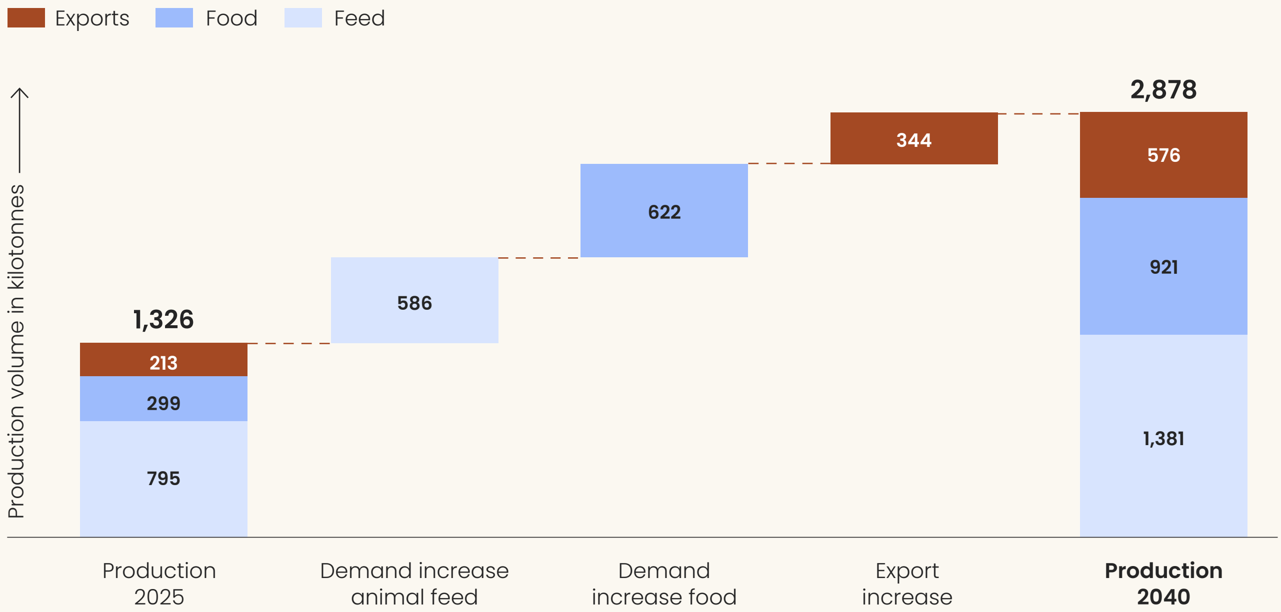
Implementing the recommendations of this roadmap would create a strong business case for farmers without perpetual subsidy dependence. Today, fava bean cultivation can be profitable in certain cases: fresh fava beans or high-quality food-grade beans. However, this profitability is too often constrained by market limitations and quality issues, limiting the number of farmers benefiting from it. When the strategic outcomes are reached, we expect fava beans to be profitable for both food and feed uses across the EU well before 2040 (Figure 1). While a strong, stand-alone business case for farmers and other actors of the value chain is achievable through targeted, coordinated investment, start-up support will be needed to de-risk operations for farmers, covering the temporary loss in revenue from the adoption of new practices.

Figure 1: The impact of the strategic outcomes on farm profitability across farm archetypes



To ensure farmer profitability, steady growth in demand for food and feed is needed. The roadmap projects that fava bean consumption could double by 2040. Growth would be relatively equal across food and feed sectors, leading to an increased share of fava beans for human consumption—translating to approximately one fava bean serving per person per day. This overall expansion would be driven by growth in both food and feed sectors, accelerated by public procurement commitments, targeted promotion campaigns, and strengthened feed supply chains. Achieving this balance between supply support and demand creation is critical to ensuring sector development.

Figure 2: Modelled increase in EU production and consumption volumes



Scaling fava beans production and consumption across the EU would generate significant benefits spanning strategic autonomy, public health, and environmental sustainability. The impact analysis, shown in the roadmap's impact framework, demonstrates quantifiable gains across multiple dimensions. Strategic autonomy improves as Europe reduces dependence on imported synthetic fertilisers and protein meals, protecting our food system from price volatility and geopolitical risk. Public health benefits arise from increased fibre consumption, with avoided healthcare costs from diet-related disease prevention. Environmental gains emerge through reduced pesticide use and CO2 emission savings from rebalancing the protein mix. These benefits create a compelling case for action that extends far beyond individual farm profitability.

This is the moment for the legume renaissance in Europe. The policies required are within reach. Market appetite exists among consumers, retailers, and food & feed producers. The approaches are proven through farmer examples across the EU. Investment frameworks are available through existing programmes. **What is required is deliberate, coordinated action that recognises the long-term nature of agricultural investment and the imperative of value chain collaboration.** The coming decade will determine whether European agriculture embraces this transformation. The choice, and the opportunity, are ours to seize.

Figure 3: Annual macro effects from expected increase in fava beans consumption by 2040

63k tonnes
Avoided fertiliser application

27m euros
Reduced fertiliser imports

350k tonnes
Reduced import of protein meals

42m euros
Avoided healthcare costs

7m tonnes
Avoided CO_2e emissions

209 tonnes
Avoided global pesticide use

1. Introduction

Legumes have strong potential to address the challenges facing the EU's protein system today. Fava beans, as Europe's oldest cultivated legume, show particular promise as a high-quality source of protein and fibre for both food and feed, yet remains a minor crop across European fields.

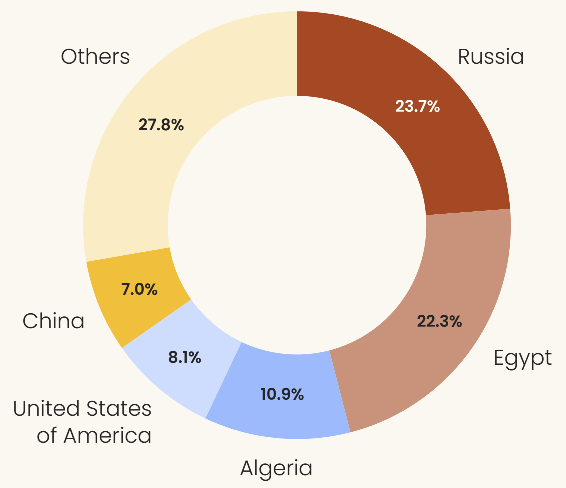
1.1. The potential of legumes to strengthen the EU protein sector

The resilience of the EU protein system is increasingly questioned as it is shaped by four interconnected challenges: declining strategic autonomy, rising health concerns, mounting environmental degradation, and persistently low farm revenues.

At the heart of the EU's food economy, the protein system supplies protein in volumes that surpass population needs, with per-capita intake above recommended levels today (1). Yet structural risks persist: around two thirds of the EU's high-protein feed is imported, with 85% of EU soya imports coming from Brazil and the United States alone (2). As represented on Figure 4, the EU is also heavily reliant on imported fertilisers (approximately 30% of inorganic nitrogen, 68% of phosphates, and 85% of potash by consumption) (3) which undermines strategic autonomy, particularly in the current geopolitical context. At the same time, diets remain misaligned with health recommendations, with a frequent overconsumption of protein and saturated fats, and insufficient intake of fibre from legumes, fruit, vegetables and whole grains (1,4). Low-fibre diets are known to significantly increase the risks of cardiovascular diseases and type 2 diabetes (5), and a Finnish study shows that raising fibre intake sufficiently to reach a prevention level for type 2 diabetes alone would save €286–€989 million in Finnish health care costs over 10 years (6).

At the same time, farming generates 11–13% of EU greenhouse-gas emissions, with livestock accounting for a large part within the sector (8). These externalities continue to erode biodiversity and soil health, gradually degrading the conditions that enable food production. Meanwhile, farmers face structural pressures: tightening margins and persistently low incomes, climate stress, fewer young entrants, and investment cycles that unfold over decades.

Figure 4: Origin of fertilisers imported by the EU (37)



Improving the EU's protein system is challenging because it spans livelihoods, culture, and decades-long farm investments, and needs balance rather than opposition. It is not about positioning animal against plant proteins; it is about evolving towards a balanced, regionally appropriate mix that sustains farm incomes, reduces environmental impacts, and improves public health. Animal agriculture remains central to farm economics, representing about 40% of agricultural revenue in the EU (7), and eating habits reflect long-standing cultural traditions. A rebalancing of the EU protein system must recognise the diversity of European farmers—in their practices and regional contexts—and work with the timescales of farming, where change is necessarily gradual. What is needed are long-term, inclusive strategies that de-risk on-farm decisions, align with climate goals, and respect regional realities: no single model fits all, but a coordinated, adaptable approach such as the upcoming Comprehensive Protein Plan can guide the EU towards a more resilient protein future.

Legumes can relieve multiple pressure points across the food and feed systems, even if they are not a silver bullet. Europe has a long history of legume cultivation, with varieties adapted to diverse agro-climatic zones, which makes them well suited to feature in a forward-looking EU protein strategy across both food and feed. Concretely, legumes can advance four objectives:

• **Increased strategic autonomy:** Legumes provide high quality protein, averaging around 20–35%, or higher for some varieties, and can be used for both food and feed (9). Expanding well adapted European varieties would reduce dependence on imported high protein meals for livestock. Legumes also fix atmospheric nitrogen, cutting mineral nitrogen needs in rotations and improving soil function. Meta analyses show that, under the right management, legume pre-crops boost following crop yields and can build soil organic matter (10). This directly complements EU efforts to reduce exposure to imported fertiliser inputs and to improve soil health.

• **Healthy diets:** Legumes are rich in protein and fibre and low in fat (11); in 2019, about 60,000 deaths across the EU could be attributed to diets low in legumes (5), a burden that would fall significantly with intake closer to health guidance.

• **Reduced environmental impact:** Per gram of protein, pulses generally have some of the lowest greenhouse gas and land footprints of all protein sources. Shifting the diets to include more legume protein thus lowers emissions and water use. At the same time, legumes typically store large amounts of carbon in the soil thanks to their root systems (12).

• **A promising business case for farmers:** Cultivating legumes is a practical way for farmers to diversify their activities and build resilience, by widening income streams, producing on-farm feed on mixed farms to reduce reliance on purchased high-protein feed, and strengthening soil health through improved rotations. When the right market conditions are in place, selling legumes can increase farm revenues, supported by lower input costs for fertilisers and pesticides. This roadmap sets out the actions needed to make legumes a consistently profitable revenue stream for farmers across the EU.

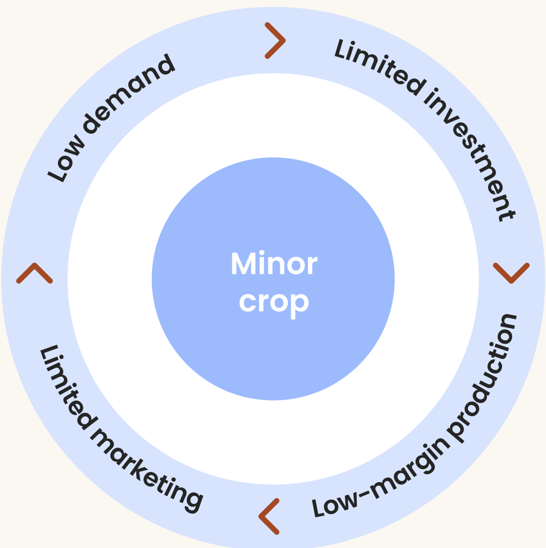
Despite these advantages, legumes remain undercultivated and underconsumed in Europe. Today, they occupy less than 3% of arable land, far below their agronomic potential (8). This share declined from roughly 4.7% in 1961 to below 2% by the mid-2010s (13), reflecting decades of specialisation, policy design, and trade arrangements (including the 1992 Blair House Agreement) that favoured cereals and imports of oilseed meals over domestic protein crops production (14).

The context however is changing, with increased focus to build a more resilient food system. Legume consumption in the EU is rising again with a growth of 5.6% between 2020 and 2025 (15). Increased resilience starts with soils: legumes enhance nitrogen supply, structure, and organic matter, reducing exposure to fertiliser imports and the expected price increase with, amongst other factors, the implementation of the Carbon Border Adjustment Mechanism (CBAM) regulation. At the same time, climate and biodiversity targets reward soil-restoring rotations, and demand for healthier, lower-impact proteins is growing, both for food and feed. **Scaling Europe's well-adapted legumes is therefore a strategic investment in our future to strengthen farm incomes and circularity, cut import dependence for input and feed, and advance climate and public health.**

1.2. A sectoral roadmap for fava beans

Legumes and pulses face cross-chain constraints that reinforce a vicious cycle, and breaking the cycle demands coordinated action from production through to consumption. As with many under-developed commodities, limited investment leads to lower-margin production, which constrains marketing capacity, depresses demand, and in turn discourages further investment (Figure 5). Overcoming this cycle requires solutions that cut across silos and align incentives for all actors along the chain.

Figure 5: Vicious cycle limiting crop development



This report intends to break this cycle through a co-created strategy with all actors of the chain to grow together, tackle bottlenecks, and align policy and market actions so every segment, especially farmers, can profit. It pinpoints the key challenges and assigns coordinated actions and policies that lift production, processing, markets, and demand simultaneously. By addressing issues holistically, it aligns incentives from field to fork, enabling collaborative progress instead of scattered fixes. This value chain approach has proven effective elsewhere (e.g. Canada's plant-based protein sector, see Box 1) and is increasingly adopted internationally. At its core is shared profitability and predictability for investments on the farm and across the value chain, leading to increased competitiveness of the sector.

We focus on a single legume, fava beans, to make discussions concrete and actions specific, while shaping recommendations that are relevant for all legumes. Focusing on one crop allowed us to engage the right actors, set measurable baselines, and propose targeted solutions for food and feed. Most bottlenecks however are similar across all protein crops, including seed and agronomy support, simple grading standards, cleaning and processing capacity, predictable offtake, procurement levers, and demand creation. As a result, many of the solutions developed for fava beans are intended to be broadly relevant to other legumes cultivated in the EU.

This roadmap was co-created with the value chain: 19 stakeholders were convened across inputs, farming, processing, distribution, retail, academia, and civil society, complemented by over 90 expert consultations. These participants contributed insights and worked together to develop the roadmap, focusing on improvements for the full value chain rather than isolated interests. Participation demonstrates a commitment to growing the sector but does not imply endorsement of every recommendation across the value chain; views remain those of the individual organisations, and the final proposals reflect *The Protein Project's* synthesis of the process. The collaboration strengthened shared understanding and coordination. Figure 6 lists taskforce organisations; expert contributors are detailed in the Appendix.

The report is designed for diversity and balance, in order for recommendations to work across farming systems and end-uses. It recognises regional differences in soils, practices, climates, rotations, and markets, and aims for solutions that serve farmers, the planet, and people. Recommendations aim to improve profitability in every value chain segment, with farmer viability at the centre, and serve multiple outlets from feed to food. By design, this EU-level roadmap cannot capture all regional nuances, and regional and local stakeholders must adapt and contextualise these recommendations to their specific circumstances. Taken together, these actions create a shared pathway for every actor to thrive and for Europe's protein system to become more resilient, healthy, and fair.

Taskforce members:

Figure 6: Overview of the 19 taskforce members

Box 1: Story of Protein Industries Canada

Protein Industries Canada: Driving Canada’s Plant-Based Protein Ambitions

Canada has set the ambitious goal of capturing around 10% of the global plant-based protein market by 2035, across both food and feed. To help deliver this, it launched Protein Industries Canada (PIC) in 2017: a public–private initiative designed to connect the full value chain—from seed genetics and crop production to ingredient processing and food innovation.

The core idea is straightforward but powerful: move beyond exporting legumes mainly as commodity crops, and increasingly turn them into high-value ingredients and products that can supply processors and brands globally. PIC is projected to contribute up to $25B per year to the Canadian economy and support 17,000 jobs.

What makes PIC stand out is its consortium model. Projects are built across the chain, bringing together seed and breeding innovation, on-farm production (often via cooperatives), processing and ingredient manufacturing, and downstream product development with brands and retailers. PIC describes this as a “full value chain approach”: getting all actors moving in the same direction at the same time, so that production, processing capacity, and market demand can scale together.

This model has been enabled by significant public investment. In 2018, the Government of Canada (via Innovation, Science and Economic Development Canada – ISED) signed an agreement to invest up to ~$153M, matched dollar-for-dollar by the private sector. Since launch, PIC reports ~$740M committed across 93 contracted projects, showing how coordinated public–private finance can crowd in capital for scale-up. Beyond funding, public institutions have played a critical enabling role: the National Research Council Canada (NRC) and Agriculture and Agri-Food Canada (AAFC) supported PIC by sharing projects, connecting companies to the right public support instruments, and helping strengthen export partnerships.

These efforts are already paying off: Canada is now the world’s largest exporter of pulse crops (CAD $3.9 billion in exports), and major successes like the opening of the world’s largest pea protein facility in Manitoba are cementing its role as a global hub for plant-based proteins.

While PIC is largely geared towards building Canada’s export strategy, it shows what becomes possible when an ecosystem aligns around a shared goal, an inspiring reference point for efforts to turn the EU’s domestic protein ambitions into a reality.

1.3. Why fava beans?

Fava bean (Vicia faba L.) is one of the world's oldest crops and a versatile food-and-feed legume embedded in European farming systems. Also known as faba bean, broad or horse bean, it has been used for millennia across the Mediterranean, Near East, and Europe (16). The story below highlights how fava beans evolved from a sacred crop in the ancient times – a hero of countless legends saving entire populations from famine – to the crop we know today. In this report, "fava bean" covers all varieties grown for human consumption and livestock feed. The crop can be eaten fresh or dried, milled into flour, or processed to obtain protein concentrates and isolates; it also delivers agronomic services as a rotational crop, nitrogen fixer, and, in some regions, a winter cover.

Box 2: The history of fava beans through time

A Bean Through Time:
The Remarkable Journey of Fava Beans in Europe

Long before avocados graced our brunches or quinoa became a household name, there was the humble fava bean—and it may well have been humanity's very first cultivated crop. The story of this ancient legume is one of survival, superstition, and surprising influence across European history.

From the Fertile Crescent to the Mediterranean

The fava bean's origins trace back over 10,000 years to the Near East, where Neolithic farmers were cultivating them even before wheat and barley took hold. These early agriculturalists understood what modern science now confirms: fava beans are nutrition powerhouses, packed with protein and fibre and capable of thriving in challenging conditions. From these ancient fields, the bean travelled along trade routes—likely carried by Phoenicians, Greeks, and Romans—spreading across the Mediterranean to North Africa, Sicily, and eventually throughout the rest of Europe (36).

The Bean of Life and Death

Many in the ancient world had complicated feelings about fava beans. Egyptians cultivated them extensively, even depicting them in temple art and papyrus. Yet Egyptian priests reportedly avoided them, associating the beans with the underworld. The Greeks and Romans shared these supernatural beliefs—the black spot on the bean's flower was seen as a symbol of death, and the plant's hollow stalk was thought to be a pathway to Hades (37).

Then came Pythagoras, the mathematician we remember for triangles but who was equally infamous in his time for his passionate hatred of fava beans. According to legend, Pythagoras believed that beans contained the souls of the dead, making eating them a form of spiritual cannibalism. He forbade his followers from even touching the legumes. The story goes that when fleeing from attackers, Pythagoras reached a field of fava beans and, refusing to trample them, stopped in his tracks—allowing his pursuers to catch and kill him. Whether true or not, this tale captures the mystical reverence the ancient world held for this crop (38).

Medieval Staple: The Bean That Fed Europe

Throughout the Middle Ages, fava beans were the undisputed king of European legumes. Before 1492, they were literally the only edible bean Europeans knew. When the word bean is used in European texts prior to 1492, it is almost always the fava bean. They became a cornerstone of the medieval diet, particularly for common people, who ate them fresh in spring, dried them for winter, and even grounded them into flour for bread during times of famine (38).

And here's where Charlemagne enters the story. Around the year 800, the great Frankish emperor issued his famous Capitulare de Villis—a comprehensive ordinance for managing royal estates. Among its many provisions was a list of plants that every royal manor must cultivate. Sure enough, "broad beans" (faba) appear on this list alongside peas, chickpeas, and various herbs. While this was an aspirational document, it demonstrates that fava beans were considered essential enough to warrant imperial mandate. They were grown in monastery gardens, castle grounds, and peasant plots across Charlemagne's empire (39).

A Sicilian Saint and Lucky Beans

In medieval Sicily, fava beans took on near-miraculous status. During a devastating drought and famine, Sicilians prayed to Saint Joseph for relief. When the rains finally came, the hardy fava beans were the only crops to survive, saving the population from starvation. Ever since, fava beans have been considered "lucky beans" in Sicilian culture, displayed on altars each Saint Joseph's Day (March 19) and carried in pockets for good fortune (40).

The Great Decline

The fava bean's reign as Europe's sole bean ended abruptly in the 16th and 17th centuries with the Columbian Exchange. Spanish and Portuguese traders returned from the Americas with Phaseolus vulgaris—the commonly known bean family that includes kidney beans, black beans, and green beans. These "New World beans" were easier to prepare (no need to remove the tough outer skin), grew well in European climates, and offered exciting variety (38).

The fava bean, once indispensable, was gradually relegated to regional cuisines and animal feed. By the 18th century, what had sustained Europe for millennia became known dismissively as "poor man's food". The very beans that had fed pharaohs, sparked philosophical debates, and saved Sicily from famine were now seen as old-fashioned.

Full Circle

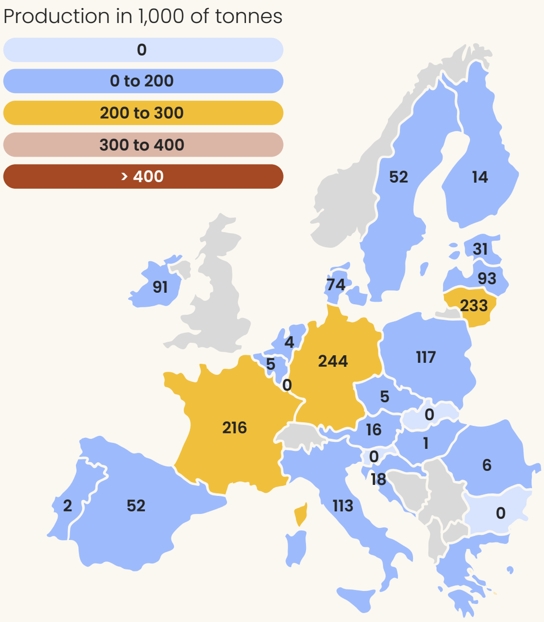
Today, as Europe seeks greater food security and sustainable protein sources, the fava bean is experiencing a renaissance. Those same qualities that made it invaluable to our ancestors—nitrogen fixation, climate resilience, nutritional density—are exactly what modern agriculture needs. From Neolithic fields to Charlemagne's gardens to today's sectoral roadmap, the fava bean has been quietly waiting, ready once again to nourish Europe's future. Perhaps Pythagoras was right to believe fava beans held something sacred—not the souls of the dead— but the seeds of sustainable agriculture that could contribute to European farming for generations to come.

Following a comparative assessment of 15 legumes, fava beans were selected as the focus of this sectoral roadmap because of their strong performance across five criteria: (A) climate suitability, (B) health benefits, (C) cross-applicability for food and feed, (D) value-chain maturity, and (E) environmental benefits.

(A) Climate suitability

Fava beans are well adapted to Europe's temperate climates and diverse soils, offering resilience and cover-crop potential. As shown on Figure 7, they are cultivated widely across Europe thanks to numerous varieties suited to local conditions. They perform best on medium-textured soils with neutral to alkaline pH yet remain adaptable across soil types. Natural frost tolerance, and winter types bred for cold, enable autumn sowing and use as a high-potential cover crop (16).

Figure 7: Annual fava beans production across EU countries in 2024 (44)



(B) Health benefits

Fava beans provide high-quality protein and fibre for food and feed, and their nutritional and functional performance can be further improved through processing. They generally offer good digestibility, and their amino-acid profile can easily be further balanced when paired with cereals. On average, dry fava beans contain around 27 g of protein per 100 g, and their comparatively low allergenicity broadens their appeal across product formats (11).

(C) Cross-applicability for food and feed

Fava beans are highly versatile, serving fresh and dry markets, processed foods, and livestock feed. For people, they can be eaten fresh or dried and used in plant-based meat and dairy analogues, baked goods, and snacks. Their mild flavour and functional properties such as foaming, emulsification and fibrous texture make them attractive to manufacturers (17). For animals, they offer a protein- and starch-rich option that can help reduce reliance on imported soy (18).

(D) Value chain maturity

Although still a minor crop, fava beans are gaining momentum, with significant growth in volumes and consumption over recent decades (more details in Section 2). Rising awareness of environmental and health benefits, coupled with versatile food and feed applications, has pulled demand forward. At the same time, breeding programmes, agronomic trials, and processing innovation are expanding across Europe. This roadmap aims to accelerate that trajectory, strengthen the chain, and improve profitability and scale.

(E) Environmental benefits

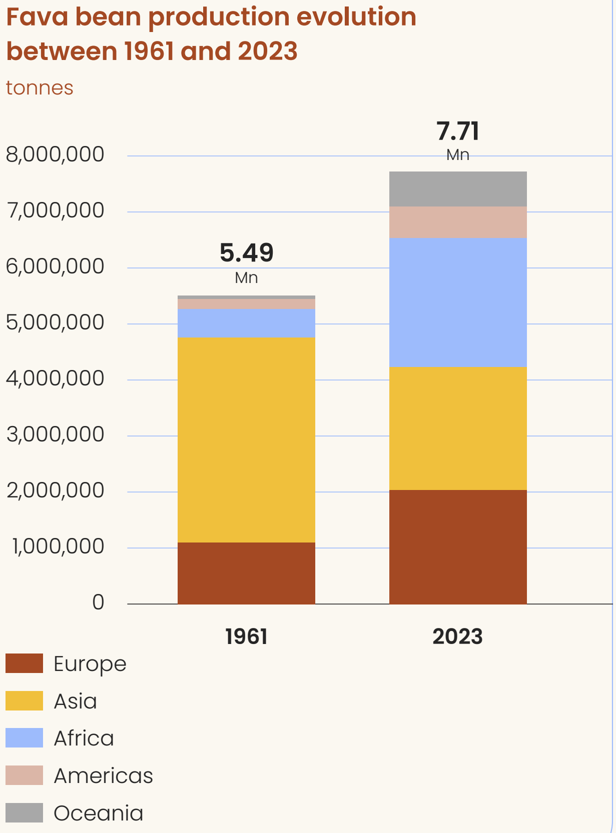
As a grain legume, fava bean is a powerful nitrogen fixer that improves soils and directly reduces the need for synthetic fertilisers, both for the crop itself and for subsequent crops. Depending on soil, variety, and climate, fixation can return roughly 260–320 kg/ha of nitrogen (19), with about 45 kg/ha remaining in the soil after harvest and available for use by subsequent crops (20). The roots build soil organic matter, enhance soil structure, lower tillage needs, and help suppress weeds, diseases, and pests with fewer chemical inputs (21). Processing side streams such as hulls and starch residues can be valorised for animal feed or other food applications, supporting circularity and improving producer margins (22).

2. The situation of fava beans today

Fava beans deliver essential agronomic benefits across European farming systems. Yet the crop remains constrained by structural barriers across the value chain. While feed markets still dominate, food applications are expanding rapidly, driven by renewed interest in fibre-rich, locally sourced proteins and deep cultural traditions that span Mediterranean cuisines to emerging plant-based innovations. Realising this potential requires coordinated action to address key challenges in breeding, farmer support, processing infrastructure, and market development.

2.1. A growing crop with room for expansion

Figure 8: Overview of fava bean production across regions between 1961 and 2023 (23)



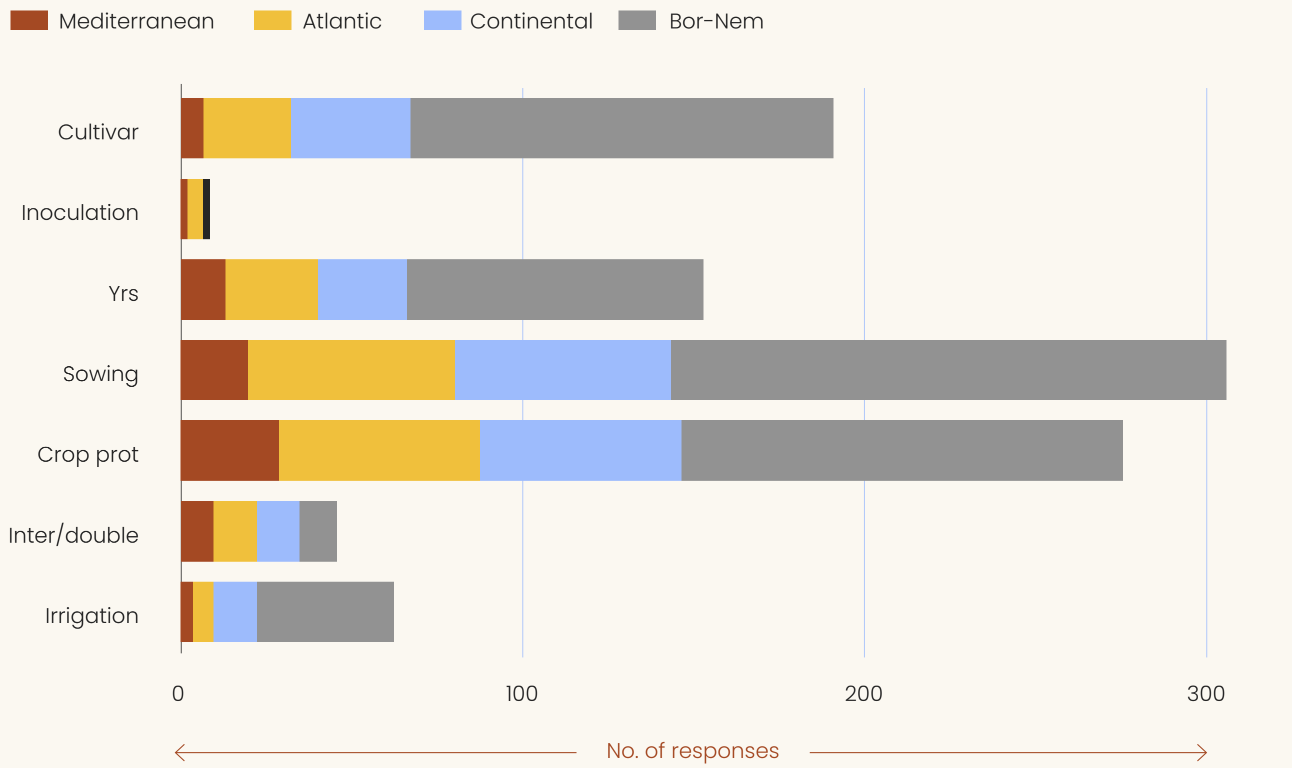
Global fava bean cultivation is on the rise with an increase in volume of about 40% since the 1960s, reaching a production of around 7.71 million tonnes in 2023 (Figure 8).

Over the same period, Europe's share of the global production climbed from 20% to 26% (23). This underscores the region's suitability for the crop and the growing recognition of its versatile uses. Yet the footprint remains small: about 500,000 hectares are devoted to fava beans compared with 61.5 million hectares for wheat (23).

Within the EU, production is diversified across climates, confirming that fava beans are highly adaptable. France, Lithuania, and Germany each contribute roughly 10% of EU production. For fresh harvests, Poland and Italy join France at the top, reflecting the crop's place in Mediterranean diets (23). From France's temperate conditions to Lithuania's continental winters and Italy's hotter summers, fava bean cultivation across these settings demonstrates broad agronomic fit.

Fava beans remain a minor crop, held back by the low and unstable yields as well as the variability in harvest quality. A significant yield gap persists, which agronomic expertise can help close, even with today's varieties. Even though significant yield improvements have already taken place – as supported by the 31% increase between 1990 and 2010 (23) – farmers often cite variable yields and limited varietal performance as barriers, coupled with an incomplete toolbox to manage their crops. Yet varieties and inputs are only part of the story. According to growers, effective sowing practices (sowing date, depth and rate) were identified as the main management factor impacting yields, followed by the limited options of crop protection and cultivars (Figure 9) (24). Across regions, a gap remains between the potential yield advanced by scientists and breeders, and the actual yield obtained on the field. This yield gap averages about 2 t/ha (25), and narrowing it would reduce financial risk, raise margins, and make the crop more attractive to integrate into rotations. Additional plant genetics improvement, facilitated through seed breeding efforts, could even further increase its potential.

Figure 9: Fava bean farmers' responses to the most important management factors affecting yield across European regions (24)

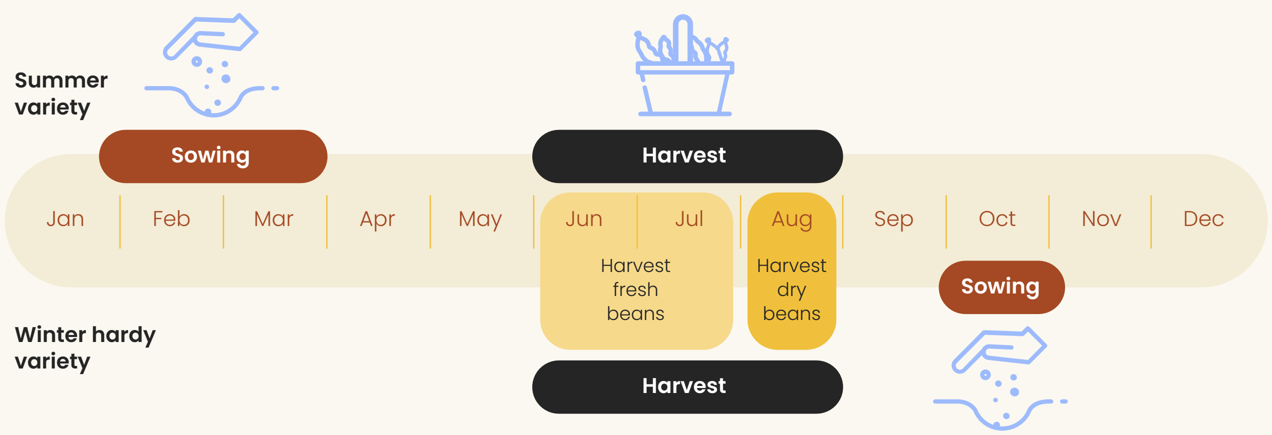


2.2. A suitable crop for various agricultural strategies

Fava beans strengthen farming systems through both temporal and spatial diversification, delivering soil, pest, and rotation benefits. Cultivating fava beans delivers clear agronomic benefits across farming systems, benefits that are especially valuable on organic or regenerative farms that do not rely on chemical input. Like other protein crops, they slot into rotations to improve soil health, disrupt pest and weed cycles, and diversify income. In temporal diversification, fava beans are grown alone before or after another crop as a main cash crop, a fodder crop, or a cover crop, which is the approach used by Meghan, Benedikt, Mathias and Max (Boxes 3, 4, 5 and 8 below). In spatial diversification, fava beans share the field with another crop at the same time via mixed planting, intercropping, strip cropping, or companion cropping. Alexis's rapeseed–fava bean companion system exemplifies this: the fava bean boosts rapeseed performance and is left in the field post-harvest to add biomass (Box 6). In mixed, inter- or strip cropping systems, co-crops may be harvested together for feed – as is being done on Thomas' farm (Box 7) – or separately using sorting or dedicated machinery. The choice of approach depends largely on the intended end-use of the harvest, as well as on the equipment at the farmer's disposal. Across all approaches, fava beans' biological nitrogen fixation is the primary engine of soil health gains, complemented by better rotation hygiene (26).

Although most fava bean varieties available on the market are "spring varieties", several breeders have developed "winter varieties" that are gaining traction with farmers. The winter types can be sown just before the winter, capturing additional value by selling the beans the next summer (see Figure 10 below).

Figure 10: Sowing and harvesting timeline of spring and winter fava bean varieties (45)



Box 3: Story of Meghan Sapp, farmer in Navarra (Spain)

Meghan Sapp
Selling fresh fava beans at the local market in Spain

On her mixed regenerative farm in Navarra, Meghan has been cultivating fava beans for the past six years, and her enthusiasm about them has only been growing since.

Today, around 100 square metres of land are dedicated to fava beans cultivation in the crop rotation, allowing Meghan to fulfil part of the demand of the neighbouring communities.

The first batch of seeds were given to her as guardian from the local seed network (Red de Semillas de Navarra), offering local varieties that had been in the area for more than 60 years. Today, the seeds are collected directly from the fields. To ensure the strongest genetics are passed on, Meghan deliberately selects the pods with the highest number of beans and keeps the largest ones as seeds for the next season, gradually reinforcing the resilience and productivity of her crops. "I now have seeds that are fully adapted to the climate and soil conditions of my farm and that have become resistant to frost and snow. Even hail doesn't knock the flowers off the plants anymore".

The beans are sown in October and harvested by hand when they are ripe and green in May. "Fava beans season in Navarra is anticipated with as much excitement as asparagus season", says Meghan. By selling her fresh beans at the local market, a similar profitability as for her farm-grown tomatoes can be reached, with selling prices averaging around €7/kg in pods and €15/kg frozen. The lower-grade beans are kept on the farm as feed for the animals, contributing to the farm circularity.

"Fava beans season in Navarra is anticipated with as much excitement as asparagus season"

Meghan's enthusiasm for cultivating fava beans is growing, along with her appreciation of their role in the ecosystem of a regenerative farm. Being a member of the European Alliance for Regenerative Agriculture (EARA), she brings first-hand legume experience to her advocacy for a more sustainable agri-food system. Given the success of this crop both on her land and in the baskets at the local market, she is now experimenting with summer cultivation to make fava beans a year-round crop on the farm, enabling locals to tap into their family recipes more than a few weeks per year.

Box 4: Story of German farmer Benedikt Sprenker

Benedikt Sprenker

Using fava beans as circular feed for his pigs while capturing additional value by transforming high-grade beans to supply the food market

In Western Germany (Nordrhein-Westfalen), Benedikt farms alongside his father, his wife, two employees and two apprentices on land his family has tended for seven centuries.

He began integrating fava beans into the rotation in 2002 to strengthen soil health, build resilience, and secure a local protein source—first and foremost for the pigs he raises—while continually testing new varieties to adapt to shifting conditions. Today, the farm typically cultivates 20–25 hectares of legumes each year, with fava beans as a pillar of that mix, improving soil structure, boosting system stability, and adding to the farm's carbon balance.

The majority of the fava beans production remains on the farm to feed the pigs. It's highly nutritious, the animals love it, and the cost savings from importing feed are non-negligible. Benedikt captures additional value by keeping a small share of the highest quality beans to supply the food market. They are cleaned and processed on-site to create easy-to-use falafel mixes which are then sold through short, reliable channels including his farm shop, an online store launched in 2023, and partnerships with nearby supermarkets. Internalising the fava beans processing ensures more of the margin stays on the farm, and while Benedikt's falafel sales only represent a small share of the farm's income, they remain the most profitable way to sell his beans.

Philosophically, he doesn't see plant and animal proteins in competition; they complement each other on the same landscape, and on the same plate. "I would love to see people having bacon and fava beans together for breakfast", says Benedikt. By using low-grade legumes as animal feed, he revalorises waste streams, improves efficiency, and bolsters his farm's incomes. Still, he's clear-eyed about what it will take for more farmers to follow: secure and fair prices at the farm gate and investment in regional processing. "We need a European strategy that ensures better income opportunities for both plant and animal products" he notes. He also argues for a dietary shift towards eating more legumes/pulses, with meat consumed in moderation but of higher quality—much like the diet of his grandparents. A rise in demand for food-grade legumes is key to further strengthen the business case for Benedikt and other farmers.

"We need a European strategy that ensures better income opportunities for both plant and animal products"

Looking ahead, he advocates for steady policy support and stronger local value chains so that European pulses—fava beans included—can become a dependable, long-term option across rural regions.

Box 5: Story of Danish farmer Mathias Pedersen

Mathias Pedersen
Transitioning from pigs to legumes on a Danish family farm

On the fertile lands of central Zealand, Denmark, a nine-generation farming family has undergone a remarkable transformation.
What was once a conventional pig farm with 1,800 sows and ~60,000 piglets is now Bælgkompagniet, a pioneering organic legume and pulse processor operating across 450 hectares. Approximately 75 hectares are dedicated annually to organic legumes within a six-year crop rotation that includes fava beans, peas, lentils, oat, barley, wheat, quinoa, and buckwheat. Today, the farm supplies Copenhagen's major hospitals, bakeries, and consumers with locally grown, high-quality protein products.

After studying Environmental and Food Economics at Copenhagen University, Mathias Pedersen returned to the family farm in 2018. However, he found little interest in his family's core business—conventional pig production. "Animal production was not my niche," he explains. "I find crop production more fascinating. With crops, you have seasonal differences, you can experiment, you can adjust so many things. It's a more exciting business case."

"With crops, you have seasonal differences, you can experiment, you can adjust so many things."

What started as personal passion sparked a broader vision. Working with his father Klaus and mother Lene, Mathias identified a fundamental gap on the food market: Danish legumes of higher quality. Most pulses consumed in Denmark came from China and distant regions.

Through networking events organised by the Danish Agriculture and Food Council, Mathias connected with other farmers and food producers, discovering that the opportunity to build a competitive legume sector lay within reach. The family decided to phase out conventional pig production and transition their arable land to organic farming. In 2023, they invested heavily in on-farm processing infrastructure—converting former pig stables into drying facilities, de-hulling equipment and storage units. This infrastructure proved essential: without processing, farmers cannot achieve prices sufficient for profitability.

“The transition caused some sleepless nights because it’s new waters for all of us. It was only possible because we had very good pig prices in previous years”, Mathias acknowledges.
In the first year, revenue proved insufficient to sustain the household, and storage rooms filled with legumes while the family waited for buyers to materialise. “It’s very hard to raise money for equipment and hardware, but it’s what we needed to get going”, Mathias explains, as most agricultural funding targets experimental work rather than the physical infrastructure legume producers need.

“It’s very hard to raise money for equipment and hardware, but it’s what we needed to get going.”

Yields also proved unpredictable. Fava beans generate reliable harvests at approximately 3.5 tonnes per hectare, but lentils are far more challenging, with half the farm’s plantings this year failing to reach food-grade standards. Of course nothing goes to waste, and lower-grade legumes are sold as feed to other farms, highlighting once again the symbiotic relationship between plant and animal agriculture. Only through substantial investment in a colour sorter (equipment that sets aside contaminated seeds) could the farm meet market quality standards for human consumption.

A critical breakthrough came through Rigshospitalet, Copenhagen’s main teaching hospital. They wanted to integrate fava bean flour in meals to provide high quality and sustainable protein and fibre to patients. After struggling with bitter-tasting conventional fava bean flour from high tannins varieties, they contacted Bælgkompagniet, which produces superior flour from de-hulled beans, resulting in a great taste. A major Danish bakery followed, and today the farm has secured strong contracts with manufacturers producing food service ingredients. One year ago, the farm began actively selling processed products through direct channels, transforming storage rooms from sources of anxiety to reliable sources of income.

Bælgkompagniet operates with 10 employees, with Mathias’s background in economics proving invaluable for navigating organic certification, food licensing, and regulatory compliance.
The farm’s experience highlights a critical policy gap: farmers transitioning to legume production need targeted start-up support for equipment investment and de-risking of activities. Without access to capital for processing infrastructure, farmers cannot capture sufficient value to sustain competitive operations. EU protein diversification policies must couple cultivation support with equipment financing mechanisms, whether through subsidised loans, cooperatives, or direct investment support.

Box 6: Story of French farmer Alexis Bach

Alexis Bach
Cultivating fava beans for feed and for their agronomic benefits

In Northern France, Alexis runs a 400-hectare arable farm, managed regeneratively since 1987. Over the years he's worked hard to cut back on nitrogen fertilisers and plant-protection products like pesticides and fungicides, and fava beans have become one of his go-to tools.

Each year, fava beans are cultivated on 30-50 hectares, used in three ways. Some go in as a cover crop and aren't harvested—left on the soil to build organic matter. Some act as a yield booster companion crop for his rapeseed. In his companion cropping system, he sows the two together in August and, as autumn settles in, the nitrogen fixing ability of the fava beans helps the rapeseed to establish. Over winter the rapeseed keeps growing while the beans naturally die back, lifting soil organic matter and, over time, improving fertility and yield. The rest are grown as a stand-alone crop and sold to feed distributors in neighbouring countries.

Alexis would like to increase his production and explore additional channels, but the market uncertainty and price unpredictability make it a risky move. "The only financial support I get is via the CAP coupled-income support, and with the current market prices, it doesn't get me the profit I would with wheat", explains Alexis as a main barrier for expanding fava beans in his rotations.

"The only financial support I get is via the CAP coupled-income support, and with the current market prices, it doesn't get me the profit I would with wheat."

Looking ahead, Alexis sees strong potential replicating the companion cropping system to mix fava beans with cereals, as the beans could boost cereal yields when sown together. For this to scale across his area, farmers need straightforward access to adapted sorting equipment after harvest. If that were to be the case, Alexis believes fava beans could play a much bigger role, both in his fields and in the wider EU agricultural landscape.

Box 7: Story of Belgian dairy farmers Thomas Huyberechts & Valentine Jacquemart

Thomas Huyberechts & Valentine Jacquemart

Valorising the place of legumes on a small dairy farm in Belgium

Thomas is a 30-year-old Belgian farmer. He started his career at FUGEA, a Belgian farmers' association, after completing his agronomy studies.

Not long after, he began helping out on a nearby organic family farm run by Damien, who had inherited it from his grandparents. Their ~ 20 dairy cows are the centre of the farm's activities. A few hectares of field are used to grow the cereals that feed them, and their milk is transformed into delicious cheese sold in the farm shop on the weekend. A dozen piglets are kept on the farm, patiently waiting for the by-products of the daily cheese production they love so much. The shelves of the shop are complemented with farm-grown fruit and vegetables, as well as other products from neighbouring farms. What started as an extra commitment alongside his job soon became a second vocation. Thomas spent more and more time in the barns and fields, turning his theoretical training into hands-on experience. As Damien gradually reduced his workload in the run-up to retirement, his daughter Valentine became increasingly involved in the farm's activities. Almost a year ago, she and Thomas officially took over the farm together.

As an organic farmer, they are acutely aware of the agronomic advantages of cultivating more legumes on a farm that relies on no chemical fertilisers. Yet low and variable profitability remains a major barrier: uneven yields and limited offtake at a decent price make it hard to justify dedicating more land to protein crops. For now, the only legumes sown on their land are in wheat–pea or wheat–fava bean mixtures, which are used as feed for their dairy cows. "More and more farmers want to get back to producing feed on the farm, and that's where protein crops become interesting to complement to cereals already being grown", says Thomas. On their farm, a small mill helps to valorise grains before they are fed to the cows. "If you want to increase the share of feed you produce and integrate legumes, you need to invest in larger equipment, and that's a significant investment".

Financial support that both compensates farmers for the risk of growing more legumes and enables the upfront investments needed to better valorise their harvests on the farm could, in his view, be a real turning point. It would not only make it easier for farmers like Thomas and Valentine to expand protein crop production, but also strengthen the resilience and autonomy of mixed, circular farms such as the one he is preparing to call home.

Box 8: Story of Finnish arable farmer Max Schulman

Max Schulman
Bringing a historical crop back to Finnish fields

13 km away from the coast in the South of Finland, Max Schulman works the fields of a large conventional arable farm, where fava beans have a rightful place in the rotation.

In this region, the crop is as old as the cuisine itself—historically cooked into a hearty stew where meat and beans share the same pot. Max argues that the complementarity of animal and plant protein is too often overlooked, and sees protein diversification as an opportunity for the farming sector. As an active member of Copa-Cogeca and the Finnish Central Union of Agricultural Producers and Forest Owners (MTK), he is clear-eyed about what must change to make protein crops more attractive for his fellow farmers.

Fava beans slipped from Finnish plates as farm structures shifted in the 1970s: mixed farms specialised into either livestock or arable. Arable farmers rethought rotations; livestock farmers, aided by new trade agreements, turned to high-protein, low-cost feed from abroad. The once-popular bean lost ground in fields and attention across the value chain, from breeding to inputs. Production picked up again in the early 2000s, when feed producers reignited interest in home-grown protein, putting fava beans back on the agenda and reviving older spring varieties suited to Finnish conditions.

When Max decided to grow fava beans 18 years ago, he was looking for an easy crop to sow between cereals and oilseeds. Fava beans were the perfect fit: “They have been grown in Finland for a very long time. That makes them well adapted to the region and easy to cultivate”, says Max. “They even have the advantage of lengthening the harvesting season thanks to the good resistance to morning frosts in the early spring”. Today, he dedicates 20-30 hectares annually to fava beans, marketing roughly 80 – 150 tonnes depending on the year. After drying the beans on farm, he sells them directly to a major collector who will supply both the food and feed markets according to quality.

“Fava beans even have the advantage of lengthening the harvesting season thanks to the good resistance to morning frosts in the early spring.”

As a farmer, Max constantly plans for the future while safeguarding the profitability of his business. "If your farm isn't profitable, how do you expect the next generation to take it over?", he asks. Although fava beans bring clear rotational benefits today, there are obvious levers to make it more attractive, starting with inputs. "We need seed varieties that are future-proof, both for food and for feed. You cannot feed high vicine-convicine varieties to chicken, and humans don't like them so much either". To tackle this challenge, Max contacted a local breeder and, after years of discussions, they started working on developing new varieties.

"We need seed varieties that are future-proof, both for food and for feed."

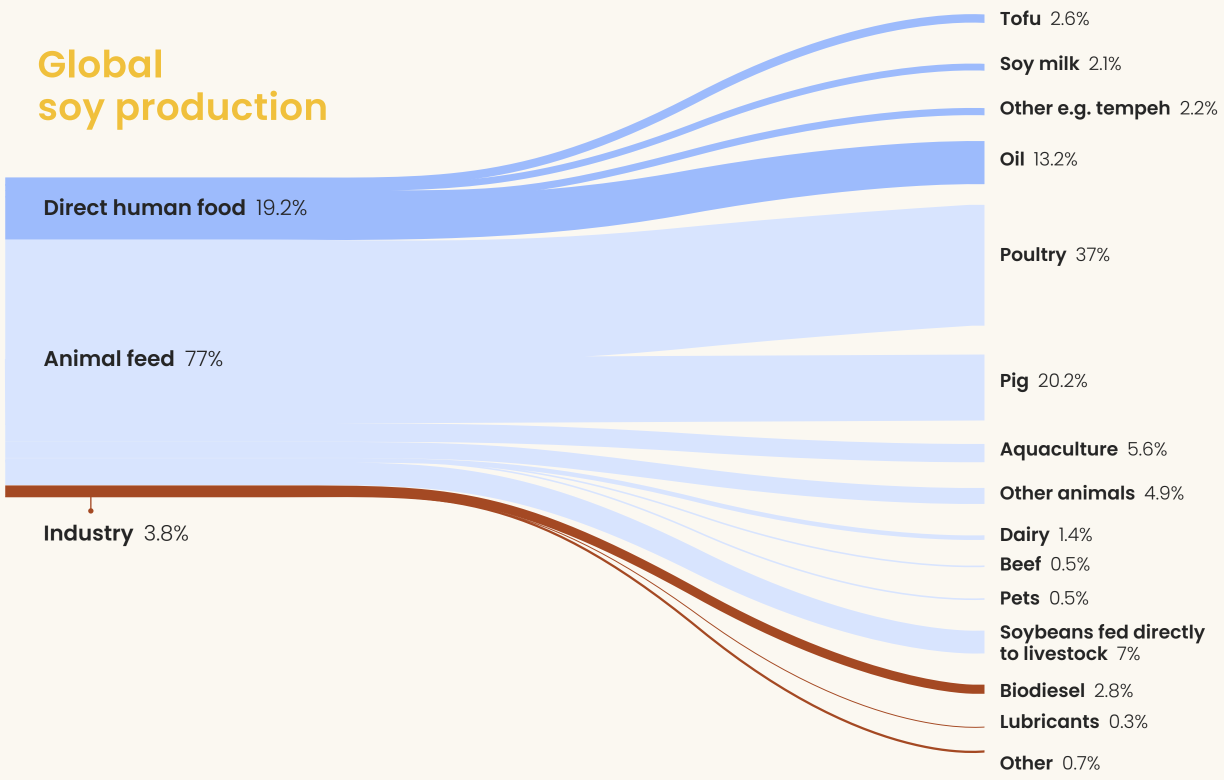
According to Max, plant protection remains the unresolved challenge in Finland and across the EU. "Companies don't see acreage grow, so they don't invest," he explains. With a thin toolbox, Max risks losing value to weeds, pests and disease. Lacking options, he devised his own weed strategy: by under-sowing a "catch crop" (usually grass or clover) shortly after sowing the fava beans, the light and space that weeds would normally use as fava beans ripen is occupied, making later control easier.

Enthusiastic about fava beans' future, Max is blunt that progress depends on market development—and that begins with trust. Trust that farmers can supply processors reliably, and trust that shelves will fill with fava bean-based products consumers love.

2.3. Current consumption and opportunities

Both in Europe and globally, the majority of fava bean production is destined for the feed sector, with a small share for food. The split is estimated at about 85% feed and 15% food, but accurate data is missing to back it up. Unlike other commodities such as soy, for which detailed data on the split between feed, food, and industrial uses is publicly available (see Figure 12), such information is largely missing for fava beans. This lack of reliable, holistic data makes it difficult to design forward-looking strategies for the value chain and its different end uses.

Figure 13: Allocation of global soy production to its end uses by weight, based on 2017-2019 data (27)



Expanding fava beans is an opportunity for the EU to substitute a share of imported protein feed, strengthening Europe's resilience. Despite growth in domestic protein crops production, Europe still imports around 30 million tonnes of soy annually for animal feed (27), leaving our food security at risk of geopolitical events. Decades of success with cereals like wheat and maize have locked much of our farmland into rotations that don't include protein crops, keeping us reliant on imports to feed our livestock. Fava beans are a practical feed across livestock species because they combine protein and starch with minimal processing. Farmers use them for dairy cows and beef cattle, pigs, poultry, sheep, and goats. The nutrient profile provides both energy and important amino acids, and, unlike soybeans, fava beans can be fed to animals with limited on-farm processing, simplifying logistics and cost.

Fava beans are suitable as part of the feed mix for pigs and poultry, especially with low-tannin (white-flower) varieties that raise digestibility. Feeding trials support ~20–30% inclusion in mixes without performance losses. Pigs tolerate up to ~25% (28) and laying hens up to ~30% (29). Fava beans are naturally rich in lysine, which both species need in high amounts, while sulphur-containing amino acids should be topped up via other feeds such as rapeseed or sunflower meals. Most fava bean varieties currently available contain a high share of tannins, a nutrient which negatively impacts the digestibility of the beans by both pigs and poultry. Breeding of low-tannin varieties therefore opens the door to further boost their presence in feed formulations.

Ruminants like cattle, sheep and goats are even more suitable consumers of fava beans, as the tannins are not a barrier but positively impact the digestion of protein in the rumen while reducing methane production. While tannins are an attention point when looking at pigs and poultry, it is not a topic of discussion for ruminants. On the contrary, their digestive system even benefits from the intake of these nutrients to stabilise the digestion in the rumen. In feeding trials ran on dairy cows, the results show that a daily intake of 4-5kg of fava beans per cow leads to high performing outcomes of milk yield and quality (18). For sheep and goats, a similar ratio to that of pigs is considered beneficial, averaging around 25% (30). On top of positive health effects, the ingestion of tannins by ruminants also has a positive environmental impact through the reduction of methane emissions compared to other low-tannin feed ingredients such as wheat (31).

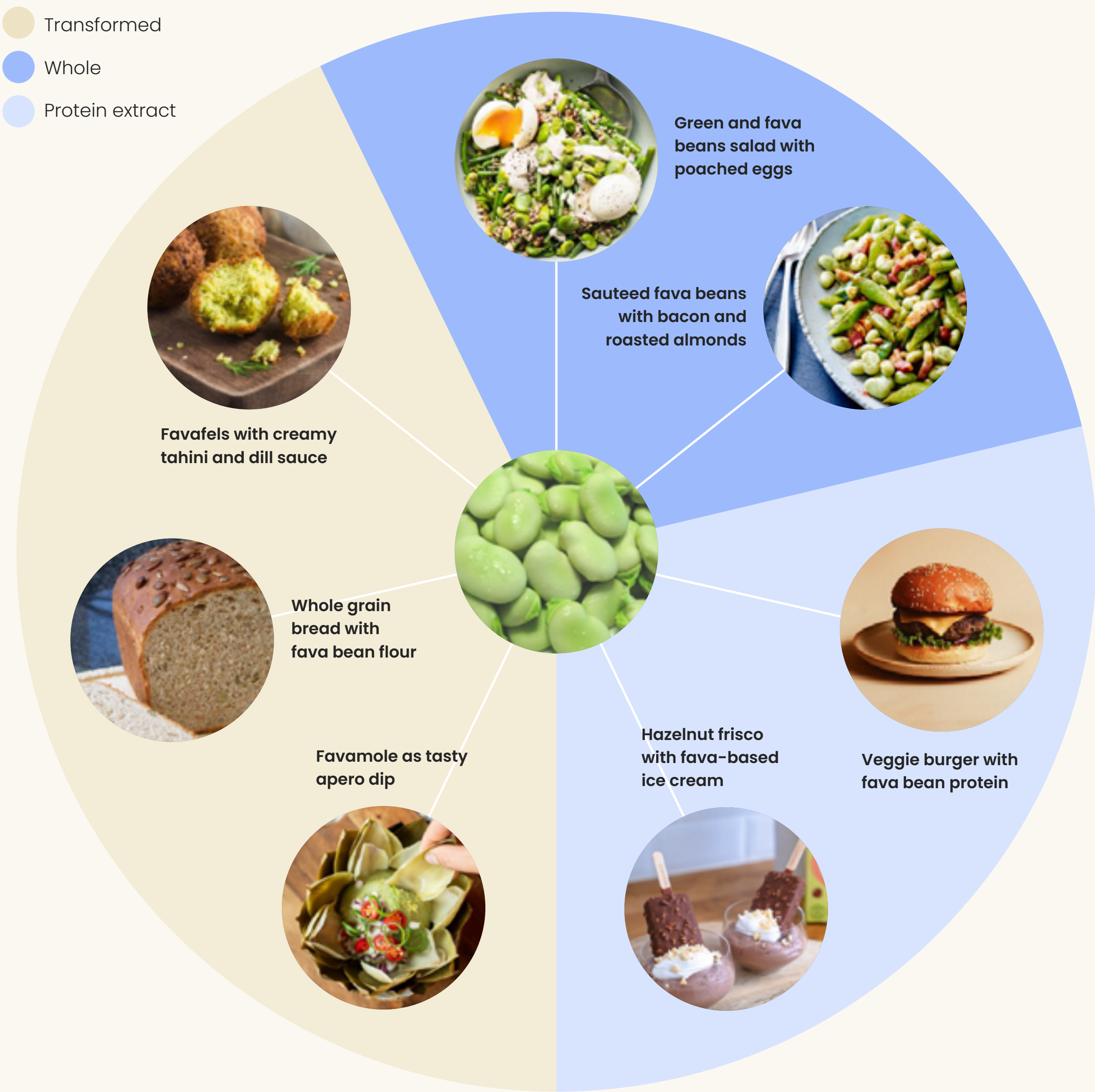
Balanced formulations remain essential, and more applied research would help scale adoption. As with any feedstuff, fava beans should be part of a mixed ration to meet full nutrient requirements. Preliminary trials are promising, but additional scientific guidance for formulators and farmers would support broader, confident use (see Section 2.4).

On the human food side, fava beans are under-consumed today, but momentum is building across multiple product formats. Industry interest is rising in fresh and canned beans, milled flours for bakery, and protein concentrates and isolates for various products (see Figure 13 below for inspirational use cases). In parallel, research efforts are increasingly focused on enhancing the digestibility of fava bean nutrients—especially protein—through processing techniques such as extrusion, fragmentation and heating, as well as through smart combinations with other ingredients (see Box 10 for more details). Despite these advances, Europeans still eat far fewer legumes than recommended. For example, the Danish Veterinary and Food administration advises ~100 g legumes per day (32), while the average European adult consumes ~10 g, and the EU projects only a 1 g increase by 2029 (5). Low intake reflects limited consumer awareness about health benefits and the still modest integration of fava beans and other legumes into mainstream dishes (more details in Section 2.4).

Increasing consumption for feed and food will require better guidance on use and stronger demand pull for healthy, sustainable diets. More applied research for feed distributors and farmers can raise inclusion rates confidently. At the same time, making legumes visible, accessible, and appealing to consumers will expand food demand. Growing consumption will, in turn, reinforce markets for fava beans and deliver benefits for consumers, European farmers, and the wider agri-food economy.

The integration of fava beans into food dishes knows no limits. Rooted in Europe's culinary heritage—from Mediterranean stews to Northern European breads—fava beans offer consumers a pathway to reconnect with traditional regional recipes while adopting healthier, more sustainable diets [1]. Figure 14 provides inspiration on how to cook and consume fava beans, making everyday meals tasty, healthy and sustainable while honouring culinary traditions.

Figure 14: Non-exhaustive overview of tasty fava bean use cases for food



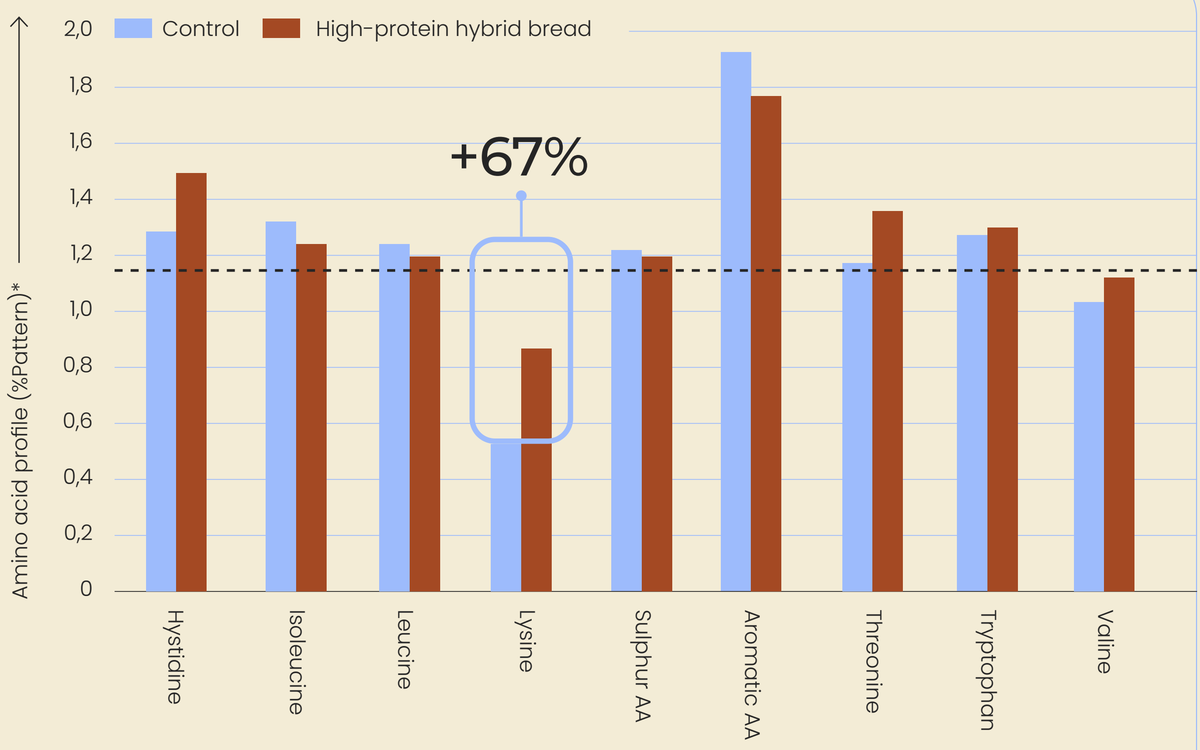
[1] About 1% of the Central European population is affected by favism, a genetic defect causing red blood cells to break down when ingesting the compounds vicine and convicine commonly present in fava beans. Symptoms include nausea, vomiting and diarrhea, abdominal pain and dizziness. In case of favism, please do not consume fava beans.

Box 9: Examples of techniques to enhance fava beans digestibility

Processing and the Nutritional Quality of Fava Beans: Moving Beyond Binary Thinking

The debate on processing presents a misleading choice between "processed" and "unprocessed" when research demonstrates that well-designed processing can meaningfully enhance fava bean nutritional value while maintaining safety and quality. This nuance is essential for realising fava beans' potential in European diets. Below are a few examples:

Example 1: Ingredients combination
Mixing different ingredients during food preparation offers immediate benefits. When fava bean flour is incorporated into bread, research shows substantial improvements in the amino acid profile, of up to 67% (see below). Such hybrid products not only increase total protein content but also create more balanced amino acid patterns—directly addressing limitations inherent in cereals alone (44).

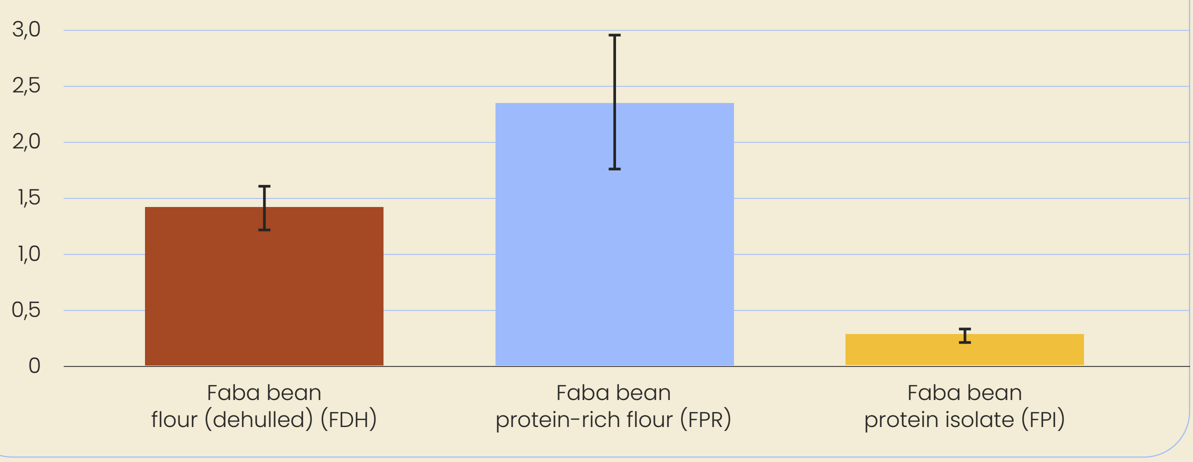


* WHO – Protein and Amino Acid Requirements in Human Nutrition; 2007

Example 2: Extraction

Protein concentration via wet or dry fractionation processes represents another powerful approach. By bringing fava bean protein to 60-65% or 90% purity through dry or wet fractionation respectively, producers can substantially reduce antinutrient levels and significantly boost protein digestibility. These concentrated proteins become more accessible to the body's digestive enzymes, delivering greater nutritional value per gram consumed (45).

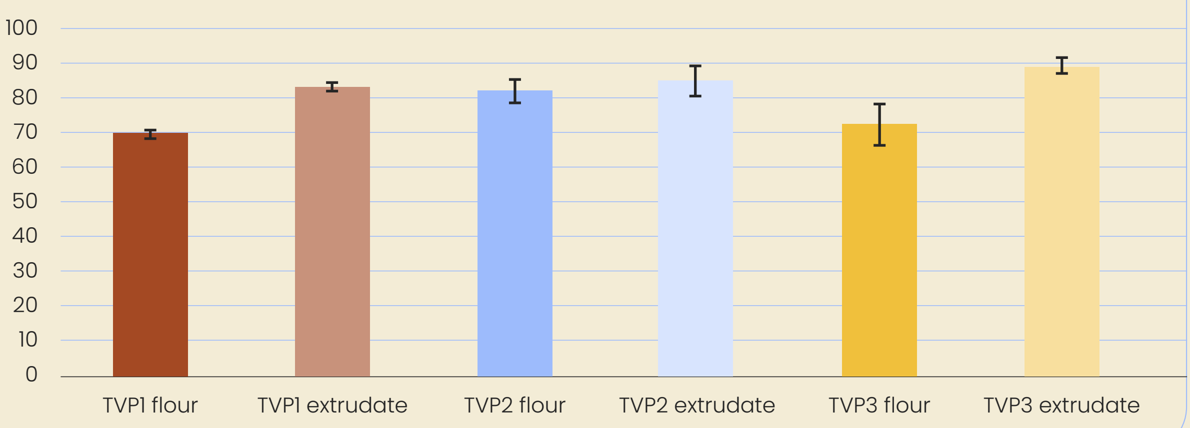
Trypsin inhibitors (TIU/mg)



Example 3: Extrusion

Extrusion offers similar advantages. This high-temperature, high-shear process reduces antinutritional factors by 71–79% in plant-based protein products, while improving overall protein digestibility. The mechanism is straightforward: heat and mechanical energy denature the compounds that limit digestion, making more amino acids available for absorption (46).

In vitro protein digestibility in % relative to BSA



Example 4: Fermentation
Fermentation demonstrates equally compelling results, particularly through tempeh production. Research on fava bean tempeh shows that carefully controlled fermentation increases protein digestibility and creates a more complete essential amino acid profile. Studies document approximately 10% improvements in digestibility compared to raw beans, alongside the release of beneficial peptides and an increase in bioavailable nutrients (47).

The key insight is not whether to process, but that it is possible to do so in certain cases, while having positive health outcomes.

Different methods yield different outcomes depending on the food context and intended use. While some processing conditions can cause minor amino acid losses through oxidation reactions, these losses are typically offset by reductions in antinutrients and improvements in digestibility. For farmers, processors, and consumers, this means that processing can be a tool for unlocking nutritional value and safety & quality, not compromising it—when applied with scientific guidance and purpose. This is crucial for farmers: having the possibility to do on-farm value adding through different forms of processing can increase the end-value they get from the product.

2.4. Key challenges across the fava bean value chain

Fava beans remain a minor crop in Europe because barriers persist across the entire value chain, from seeds and agronomy to processing, markets, and demand. Through expert interviews, ten key challenges were identified that most constrain profitable growth in production and consumption for both food and feed. Figure 15 summarises these challenges; the sections that follow explain each in turn. While our discussions centred on fava beans, the issues raised are largely systemic and relevant to other European protein crops as well.

Figure 15: Key challenges for actors across the fava bean value chain

Key Challenges

Research & innovation

- Limited progression in the development of new inputs
- Lack of research on usage impacts as feed

Farming

- Insufficient revenues from primary production, especially for the production of dried fava beans
- Transition risks
- Insufficient additional revenue streams

Transformation

- Challenging investment and business case
- Harvest variability & limited regulatory guidance

Market

- Limited integration in food products and services
- Limited direct adoption by consumers

Limited coordination between actors and data visibility

Research & innovation

Limited progression in the development of new inputs

Although several EU-funded research projects on legumes have already delivered promising results (e.g. VALPRO Path, GIANT LEAPS), legumes remain underrepresented in the funding envelope. Compared to cereals, fava beans and other legumes have received far less breeding attention and funding, and the consequences of that imbalance are visible. Because the fava bean value chain is still immature, private seed companies see little incentive to invest and collaborate, so competitive commercial varieties adapted to local conditions and agronomic management are still lacking on the market. Public spending hasn't fully filled the gap either: while the budget for the European Framework Programmes (the main funding tool for European Research & Innovation (R&I)) has grown by ~42% since the early 2000s, and several EU-funded projects have already delivered promising results, R&I devoted to seed breeding has only grown modestly and is expected to rise by only ~9% by the end of Horizon Europe. Within those breeding envelopes, legumes only account for about 12% of funding, versus nearly 30% for cereals, which keeps widening the performance gap (33).

Beyond the lack of funding, legume breeding projects often fall short because timelines are misaligned with breeding realities and project scoping remains too siloed. Bringing a new variety from early research to market typically takes 10–12 years, yet many publicly funded projects run on much shorter cycles, creating a structural risk that promising lines are not carried through to commercialisation. While the involvement of private actors is often required, industry partners are frequently brought in late in the scoping process, leaving limited space to shape objectives, validate market needs, and ensure the work translates into a viable commercial opportunity.

The same structural constraints extend beyond seeds to other essential inputs. Plant-protection options tailored to legumes are scarce, and approvals vary by member state, splintering the market. Legumes often benefit from the use of the same plant protection products as major crops, but this advantage quickly turns around when these products are suddenly taken off the market with no thought-through alternative for the minor crop depending on it. Biocontrol shows strong potential for fava bean pest control, but the authorisation procedures do not reflect current production technologies, leaving manufacturers with heavy administrative burdens and time-to-market timelines that today's expected gains cannot justify.

An additional layer of complexity is the limited coordination of research projects across the EU. Regional differences should be accounted for in designing projects that build on Member States' knowledge and strengths, reaching faster results across the Union. Further down the road, the dissemination of project outcomes is also lacking. Farmers and other value chain actors struggle to integrate the results in their activities due to the lack of access to the outcomes.

Lack of research on usage impacts as feed

On the feed side, farmers and formulators recognise the potential of fava beans to replace a share of imported protein meals, and—as outlined in Section 2.3—early multi-species trials largely support this experience. What is missing is scale and targeted studies to cover underexplored use cases. While trial results on ruminants and pigs successfully led to developing practical guidance on inclusion rates, thereby expanding uptake by feed distributors, certain knowledge gaps remain. Research suggests that additional trials would be beneficial to assess the impact of feeding fava beans to piglets, and using low vicine-convicine varieties to increase protein digestibility for laying hens. Addressing these gaps would give distributors the confidence to further expand use.

On top of variety-based research, the knowledge on the impact of processing to further enhance the nutritional quality of the beans across animal species is also limited. While the low processing requirements of fava beans makes them an advantageous crop for farmers, mild processing such as heating or soaking could further unlock their potential as feed. There is a need for standardisation of results to provide clear guidance to farmers and the feed industry.

Farming

Transition risks

Adding a new crop to rotations often brings a temporary dip in revenue, and fava beans are no exception. According to a study conducted on fava bean farmers across Europe, limited agronomic know-how on cultivar selection and crop cultivation was identified as a key factor impacting the yields, and thereby the profitability (24). As Europe's oldest cultivated crop, the lack of agronomic knowledge only became a challenge in recent decades, sparked by the drop in production during the 18th century. Yet advisory support to help farmers rebuild their expertise by exploring various manners of using fava beans in rotations (intercropping, companion cropping, main crop) remains limited, despite being a relatively cost-effective way to stabilise yields. At the same time, targeted financial support to offset transitional losses and upfront investments — such as equipment and other inputs needed to integrate a new crop — is largely absent, making adoption an additional risk on top of the uncertainties farmers already face.

Insufficient revenues from primary production

For farmers who decide to integrate fava beans in their rotations despite the associated transition risks, the farm business case often remains thin. It's important to note that profitability varies based on the quality (typically higher selling price for food-grade than feed-grade harvest), the type of beans (with fresh beans often leading to more profitability than dried beans), the agricultural practices used and their associated input costs, the sales channels opportunities, as well as the cost of land.

The current yields obtained with the available seed varieties, plant-protection products and widespread agronomic knowledge are highly variable. While potential yields for dry beans are around 5 tonnes per hectare, the EU average still stands at about 2.3 tonnes per hectare only (23), with yields dropping during periods of bad climatic conditions and increased pest populations.

Harvest quality is another major source of volatility. Depending on regional pest pressure and the availability of authorised plant-protection tools, beetles may move entire harvests from food-grade to feed-grade, significantly lowering the revenues farmers can expect. As a minor crop, fava beans (like most legumes) often lack tailored plant-protection solutions, leaving farmers reliant on products developed for major crops such as wheat. Even when these products work well on legumes, their availability is driven by decisions taken for the main crop; when a product is restricted or withdrawn, legume growers can lose a key tool overnight, often without a viable alternative — as has happened in the past.

The challenges do not stop at harvest: even where long-term offtake exists (which is rare), intense price competition against imports and other proteins compresses margins, pushing many growers toward commodity outlets or, at times, leaving harvests unsold. In the absence of a futures market for fava beans, prices are highly volatile, and because most transactions take place business-to-business, market signals remain opaque and difficult for farmers to anticipate. The result is limited bargaining power: farmers are often left to accept commodity offers that fail to reflect the value created from their harvest downstream, resulting in an uneven distribution of value-added.

Insufficient additional revenue streams

There are opportunities to strengthen the farmer business case, but they are underexplored. On-farm or cooperative processing adds value, and payments for environmental services could reward the benefits fava beans already deliver. Yet on-farm processing capacity for legumes is sparse compared with crops like wheat. Because protein crops lack a recognised sector under the current version of the Common Market Organisation, cooperative models for shared investment are rare, and building new plants is often a risky investment for processing companies at today's demand and price levels.

Crop-specific CAP support complementing area-based payments could help but varies widely across member states—from none to roughly €600/ha—and the mechanisms (from coupled income support to diversification eco-schemes such as in Germany and Denmark) are complex, adding to administrative burdens. While nitrogen fixation and soil-health improvements directly benefit farmers' business case by positively impacting the yields and reducing their use of chemical fertilisers, formal mechanisms to reward these services—and turn them into real revenue—are still limited. It's important to note that coupled income support should be viewed as complementary to other support mechanisms, as excessive emphasis on it would increase the risk of sudden peaks in production without offtake as well as price distortions further up the chain.

› Transformation

Challenging investment and business case

Processing companies face the same low value-chain maturity, but from the other end. Market uncertainty and fluctuating downstream demand weaken returns and can stall projects. Once facilities are built, they must run close to full capacity to meet targets, and raising prices to cover lower throughput is rarely feasible.

Global price pressure intensifies these challenges. The price of EU-produced fava bean protein that enable farmers to be paid fairly cannot compete with the price of imports. This severely constrains processors' pricing if they wish to remain competitive globally, which in turn limits what they can pay farmers. Side-stream valorisation could relieve some pressure, but it remains underdeveloped: unlike potato processing, where starch is a tradable commodity, fava bean workflows rarely isolate a clean starch stream and downstream markets are thin, so incentives to adapt processes stay weak.

Harvest variability and limited regulatory guidance

Nutritional and physical properties of fava beans are highly variable across harvests, affected by seed variety and growing conditions (rainfall, soils, temperature), raising challenges for both the food and the feed industries. Today, there is no rapid and cost-effective testing method to assign harvests to their end-use according to clear quality criteria (such as contamination levels, anti-nutritional factors (ANFs), protein content, pesticides).

At the same time, regulation has not kept pace with the sector's needs and food manufacturers lack standardised methods to communicate ANFs that affect taste and digestibility. In parallel, new contaminants (e.g. heavy metals, pesticides) emerge and are quickly added to safety legislations, often unexpectedly, leaving processors little time to anticipate and adapt.
While safety measures are essential, processors need timely guidance, harmonised methods, and workable transition periods to anticipate changes and adapt processes without disrupting product development. Clear, proportionate and risk-based regulatory pathways, including early guidance or consultation on novel food status where relevant, would help processors anticipate requirements, reduce uncertainty and invest with confidence, while maintaining high food safety standards.

Market

Limited integration in food products and services

The presence of fava beans and other legumes in ready-made supermarket meals and food-service menus remains very low, far below levels suggested by national dietary guidelines. Because guidance differs by member state and often lumps legumes together with vegetables, retailers and caterers have little incentive to feature them explicitly.

Chef knowledge and training are also bottlenecks. Culinary curricula devote limited time to legumes, and chefs under pressure to satisfy customers can be hesitant to use them if they fear the dishes will not meet expectations. Large kitchens also need convenient, time-saving formats (e.g. pre-processed, standardised ingredients and semi-finished components), which are still scarce for fava beans given the limited focus on food innovation. Even motivated teams therefore struggle to translate intent into menus.
At the same time, fava beans and their extracted proteins are increasingly used in processed foods, yet this "invisible" use does little to build familiarity. It also collides with growing scepticism towards ultra-processed foods. While concerns are valid for products high in sugar, salt, or fat, the UPF label often spills over to nutrient-dense legume products and dampens demand by association.

Limited direct adoption by consumers

For many Europeans, legumes are only a small part of daily eating habits, and home cooking with them remains limited. Outside regions where legumes are culturally embedded, many consumers lack basic know-how on soaking, cooking, seasoning, and pairing. Promotional campaigns on legumes are rare, and existing communication seldom highlights the specific health benefits of legume-rich diets, or show how to include them in fun and daily recipes, so awareness stays low and habits do not change.

Price signals add another obstacle. Retailers are sensitive to affordability, but in some member states comparable animal-based products benefit from reduced VAT while legume options do not. This asymmetry keeps shelf prices higher than necessary and weakens the nudge towards everyday purchases, leaving consumers with little exposure, limited guidance, and few incentives to make fava beans a regular choice.

Limited coordination between actors and data visibility

Momentum is building across the chain: growers, processors, and buyers are signalling interest, yet coordination is weak. Unlike many other crops, there is no cross-EU body to align actors, set shared priorities, and advocate for policy support, so opportunities slip through the cracks and the playing field stays uneven. Without a coordinating body, joint advertising of legumes and legume products is challenging, failing to stimulate adoption. Data gaps compound the issue: while access to data is improving, information on prices, volumes, demand, inflation, and stocks still lacks the granularity needed by variety and by grade (food vs. feed). Without that detail, planning and investment decisions remain harder—and riskier—than they should be.

3. The untapped potential for fava beans in the EU: Strategic outcomes for a thriving sector

Supportive and enabling EU policies are essential to foster research & development, help farmers manage risks, facilitate processing capacity, and stimulate demand. Combined with coordinated action from the value chain actors, the proposed strategic outcomes can unlock a sustainable and profitable growth of the EU legumes sector.

3. The untapped potential for fava beans in the EU: Strategic outcomes for a thriving sector

Supportive and enabling EU policies are essential to foster research and innovation (R&I), help farmers manage risk, build processing capacity, and stimulate demand. Combined with coordinated action from across the value chain, they can unlock sustainable and profitable growth for the European fava bean sector.

Building on the 10 key challenges, seven strategic outcomes were defined (figure 16) to strengthen the European fava bean value chain, from R&I to the market. Each outcome describes a desired end state for the sector and is paired with concrete policy actions that act as catalysts for change, mapped to the relevant policy files. Case studies from across Member States have also been included to illustrate what strengthened policies can deliver in practice. The cases are either linked to fava beans or offering transferable lessons from other commodities.

Beyond individual policy changes, the sector also needs a clear long-term trajectory for protein crops, one that gives farmers and industry the predictability to invest, scale, and innovate. This should be provided by the Comprehensive EU Protein Plan, providing a shared long-term vision and direction for market development.

Finally, the case for action would be further strengthened by preventing unfair competition from imported products that do not meet the same sustainability requirements as EU production. Ensuring a level playing field—by requiring imported farm products to comply with EU-equivalent standards on relevant inputs, production practices and technologies—would help protect fair prices and support investment in EU-grown legumes. This effect is not quantified in the modelling in Section 4, but it would reinforce the economic rationale presented there.

Figure 16: The 7 strategic outcomes of a thriving fava bean sector

3.1. Building an enabling and supportive policy environment

Strategic outcome 1
Applied research and on-farm trials generate the varieties, inputs, tools, and agronomic guidance farmers need to achieve target yields and harvest quality across different production methods

Description of the strategic outcome state:
Across Europe, fava bean cultivation advances with high-yielding, high-quality, and climate-adapted varieties tailored for food and feed. Breeding programmes deliver varieties that are winter-hardy, pest-resistant, suitable for use both as main crop and in intercropping systems; such programmes also ensure higher yield stability. Moreover, modern machinery and clear on-farm guidance support precise sowing and harvesting. Farmers have increased access to specific crop protection and strong advisory networks (digital, professional, and peer-to-peer) ensuring fava beans fit smoothly into rotations and deliver reliable yields with stable quality year after year.

Recommended policy actions for reaching the strategic outcome:

Policy Actions	Policy Vehicles
1.1 Ensure dedicated support for legumes and pulse R&D in breeding, plant protection products, bacterial inoculants for nitrogen fixation, machinery and cultivation techniques.	Competitiveness Fund (Horizon Europe), Post 2027 CAP – EIP Operational Groups
1.2 Support multi-annual (10-12 years) public-private partnerships for legume chain directed pre-breeding and breeding programmes, co-designed by all partners with a clear, market-driven commercial end-goal built in from the start.	Competitiveness Fund (Horizon Europe)
1.3 Fund qualified advisory services, short courses and lighthouse farms to improve farmers knowledge on legumes.	Post 2027 CAP
1.4 Resource EFSA to increase their capacity for file preparation advisory and reviews and thereby accelerate the time-to-market of new plant protection, especially biocontrols. Also ensure harmonisation of approval across Member States.	Biotech Act, Food & Feed Safety simplification omnibus (amendments to Plant Protection Products legislation)

Box 10: Case study Pea4Ever in France

Pea4Ever:
A breeder-led R&D coalition to restore confidence in protein peas

Launched in February 2024, Pea4Ever is a large-scale chain-directed breeding programme initiated by three French seed companies: Limagrain, Florimond Desprez and RAGT.

The programme's primary goal is to develop pea varieties that are more resistant to pests and adverse climatic conditions, ensuring higher and more stable yields for farmers. By focusing on performance improvements, Pea4Ever aims to increase the long-term profitability of pea cultivation, contributing to the broader goal of strengthening the role of peas in the European protein market.

The first step of the programme is to pool genetic resources, tools, and knowledge across the founding breeders. This innovative approach accelerates progress by ensuring that research and development are closely aligned with commercial realities, making sure the end products meet market demands. First crossing and breeding trials are already underway, and the ambition is to make new varieties available within seven to eight years, much faster than typical breeding timelines.

Producer and sector representatives are also embedded from the start. The programme is supported by Terres Univia and the FOP (producer federation) and draws on technical expertise from Terres Inovia, helping ensure the breeding targets match what growers need in the field. The collaborative spirit extends beyond the research efforts into financing of the initiative. The three founding seed companies each contribute €5M, topped with €25M from public subsidies (with a first €5M tranche already awarded), and an additional €10M brought by the sector (including interprofessional contributions).

The Pea4Ever project highlights the power of collaborative R&D and blended financing in driving innovation. By bringing together private and public sector actors from the initial design of the project, it ensures that breeding efforts are closely aligned with both market needs and farmer priorities, ultimately helping to restore confidence in pea cultivation and unlock long-term profitability for the entire value chain.

Box 11: Case study of LeguNet

LeguNet:
A network that turned scattered expertise into shared practices

In 2023, Germany built a living network with a clear mandate: ensure legumes earn back their place on German plates.

Under the Federal Ministry of Food and Agriculture's Protein Crop Strategy, the Model and Demonstration Network for Grain Legumes (LeguNet) launched with dedicated public funding (≈€5.2 million, 2023–2025, extended to 2027). The goal is practical: move know-how quickly from breeding pilots and advisory desks to real farms and real contracts so growers can reliably hit target yields and quality.

LeguNet comprises 17 partners: research institutes, breeders, producer groups, processors, advisers, and associations. The project includes specialist coordination units that operate on a supraregi-onal basis. At state level, a regional management team works to accompany and support value chains from cultivation to utilisation at the regional level, while demonstration farms make it come to life. A breeder's note on winter hardiness or standability, or a processor's feedback on moisture and tannins loops straight into variety choice, sowing windows, harvest timing, storage and cle-aning protocols the very next season. Advisers then turn lab and plot results into clear, farm-ready guidance such as seed rates, intercropping set-ups, header settings, post-harvest handling, for beans destined for food or feed.

In 2021, Germany–as one of the EU's top legumes producers–had ~245,000 ha of grain legumes, yet fava beans and peas still carried a reputation for yield variability and uncertain markets. LeguNet set out to change the lived experience on farms: let growers see climate-adapted and intercropping-friendly types perform under their own soils and weather, bring downstream users in early so quality targets aren't an afterthought, and embed peer-to-peer learning so tips on bruchid pressure, late frosts, and lodging diffuse quickly across regions. Early signals are positive: demonstration plots operate across multiple Länder, links between producers and users are becoming routine, and advisory is specific enough to change decisions—what to sow, when, with which equipment, and how to consistently meet food-grade specs.

Farmers are at the heart of LeguNet's effort: their observations on late frosts, bruchid pressure, or lodging fed straight into the next season's demonstration design. They managed to reach a steady narrowing of uncertainty, which is exactly what a farmer needs before committing hecta-res. The national picture began to shift: visibility for legumes increased, human-food opportunities moved up the agenda, and LeguNet's embedment in the BMEL Protein Crop Strategy ensured that lessons from the field were heard where programmes and budgets are set.

LeguNet shows that by accelerating breeder–adviser–farmer–processor feedback in one loop, it gets better seeds and varieties into the right regions, aligns inputs and tools with precise machinery and crop-protection guidance, and turns scattered insights into practical knowledge farmers use at sowing and harvest. The result is what the strategy demands: target yields and stable, food-grade quality year after year, making fava beans a dependable rotation crop and shifting the crop from "interesting" to "investable" in both food and feed markets.

2

Strategic outcome 2
European farmers are supported to start cultivating legumes, and rewarded for the resulting societal benefits

Description of the strategic outcome state: Growing fava beans is valued as a public good, and farmers are enabled to start cultivating the crop with confidence. To de-risk the activities, farmers receive transition support and a broader set of financial and practical instruments that cover the risks of the first years—helping them manage yield variability, build know-how, and adapt rotations and operations. This support recognises the services fava beans deliver, from improved soil health and nitrogen fixation (and the resulting reduced need for fertilisers) to healthier diets and contribution to the EU's strategic protein autonomy. Together, these measures make fava beans a viable choice, turning a marginal crop into a cornerstone of sustainable, profitable farming.

Recommended policy actions for reaching the strategic outcome:

Policy Actions	Policy Vehicles
2.1 Establish a fund, as proposed by the European Commission, enabling farmers to use CAP transition payments to de-risk innovation in the cultivation and processing of protein crops. Ensure availability of support across member states by ring-fencing a share of the budget and clarify that the fund can be used for protein crops.	Post 2027 CAP (CAP transition payments)
2.2 For the territories eligible for the EU's Just Transition Fund, request for the protein crop sector to be mentioned in the Territorial Just Transition Plans.	Just Transition Fund of DG REGIO

Policy Actions	Policy Vehicles
2.3 Request Member States to define protein crops for food and feed as a target product in their Strategic Plan to ensure access to coupled income support (CIS), and to draw up national support plans for the sector, as it currently the case for wine. Member States should be allowed to increase the share of the budget for CIS to support the cultivation of protein crops.	Post 2027 CAP
2.4 Reward environmental results of legume cultivation – for example around climate, water resilience and soil health – via agri-environmental and climate actions (AECA). Rewards should be granted via a simplified application process for farmers, and should prioritise result-based approaches, not crop-based, ensuring that rewards are granted based on measurable outcomes.	Post 2027 CAP
2.5 Establish a market for legume ecosystem-service credits, focused on fertiliser-related emissions avoided through biological nitrogen fixation. Define clear baselines, robust Measurement, Reporting and Verification (MRV) protocols, and buyer pathways (e.g. supply-chain claims, public procurement) to convert these services into reliable farmer income.	Framework for non-ETS sectors (including Land use), Bioeconomy Strategy
2.6 Enable the valorisation of legume-derived waste streams within the bioeconomy, for example by converting them into energy in on-farm facilities.	Post-2027 CAP, Bioeconomy Strategy
2.7 Establish tailored insurance mechanisms that protect farmers against legume yield variability from uncontrollable events, helping ensure income stability and profitable harvests regardless of volumes produced.	Post-2027 CAP

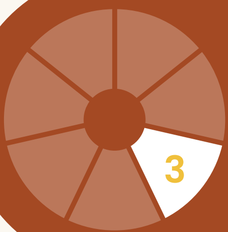
Box 12: Case study of CAP payments in France

How France uses the CAP as an instrument to incentivise legumes cultivation

Across France, targeted CAP payments have turned grain and forage legumes from "nice-to-have" rotation crops into a bankable choice, earning them a 3rd place in terms of fava beans production in the EU. By leaning hard on Coupled Income Support (CIS), France has built some of Europe's strongest incentives for peas, fava beans and lupins, and farmers have responded.

In 2023 the CIS unit rate for grain legumes was set at €122/ha. This was the result of a rapidly expanding national envelope. Since the previous CAP, the coupled aid budget increased by 75% to reach ~ € 235 million in the current file. France explicitly chose to "maximise" coupled support to drive protein autonomy, and the effects on the production are clear: national protein crops output jumped from ~158 kt in 2022 to ~216 kt in 2024, equivalent to a 137% increase. The prominent CIS for legumes has undoubtedly pushed France to its leading position on fava beans production, as outlined in Section 2.1.

The key lesson? When payments reward farmers for what they bring to the system, uptake follows. France shows that coupling a meaningful €/ha payment with a growing, ring-fenced budget can shift hectares at scale and lift production within a single programming period.



Strategic outcome 3

Value chain across the EU are strongly coordinated, and fava bean farmers are well organised and effectively supported for production, processing, and contracting

Description of the strategic outcome state:
Across European regions, fava bean farmers are organised through strong producer organisations and interbranch groups that share machinery, agronomy, and processing facilities. Young farmers are particularly well supported in their investments, encouraging them to integrate legumes into their rotations and supporting generational renewal across the sector. Producer organisations meet retailers' demand for locally-sourced legumes, giving them access to reliable data on demand and prices while acquiring a larger share of the sector's profit resulting from moving further down the value chain. The increased visibility into the market strengthens their position in commercial negotiations, and agreements for direct partnerships with food and feed actors secure steady demand, establishing fava beans as a strategic, high-value crop.

Recommended policy actions for reaching the strategic outcome:

Policy Actions	Policy Vehicles
3.1 Create a distinct protein crop sector in the Common Market Organisation (CMO), as proposed by the European Commission, and make it mandatory for Member States to recognise producer organisations/interbranch bodies upon request, unlocking access to Operational Programmes intervention.	Post 2027 CAP – Common Market Organisation, Operational Programmes (OPs)
3.2 Set up mechanism for Member States to provide targeted support for legume cooperatives to share processing costs, expand knowledge and skills sharing, and strengthen market power.	Post 2027 CAP, State Aid Rules
3.3 Enable the alignment of public support with market commitment by setting up blended finance tools for players along the value chain, from breeders to retailers, and legally enable investments in processing facilities on farms or in agricultural cooperatives.	National Regional Partnership Plans, Post 2027 CAP - Operational Programmes
3.4 Promote structured and fair partnerships between farmers, food processors, and retailers by prescribing multi-year written contracts that contain risk-sharing clauses, by using a standardised quality assessment method, and by strengthening Unfair Trading Practices.	Post 2027 CAP – Common Market Organisation, UTP Directive
3.5 Elevate current EU data collection on legumes and pulses into a dedicated 'Legumes & Pulses Observatory,' modelled on the Olive Oil Market Observatory, to provide more granular and harmonised information on prices, volumes, stocks and inflation, particularly for food-grade fava beans.	Post 2027 CAP – Common Market Organisation

Box 13: Case study of Dutch Protein Farmers

Dutch Protein Farmers: Building a Fair and Transparent Chain for Home-Grown Protein

Across the Netherlands, a growing network of farmers is rewriting the rules of how plant proteins move from field to fork. Under the banner Eiwitboeren van Nederland (Dutch Protein Farmers), they are forming the country's first producer organisation fully dedicated to protein crops. Their aim is simple but transformative: to increase the value of their products by keeping ownership across the chain, and to increase their bargaining power.

In today's conventional system, most farmers sell their harvest early, long before the product's final form reaches consumers. With Dutch Protein Farmers, that changes. The organisation signs framework agreements directly with retailers, food-service companies and processors, while outsourcing logistics and processing steps. Each step in the chain increases the product's value by roughly a factor 1.3, and by staying involved through these steps, farmers collectively capture far more of the final margin than in standard commodity trade.

The model has already attracted major buyers which value transparent supply chains and verifiable sustainability data. Farm-level metrics on emissions per kg of product are compiled with Carbon Cloud, while the Impact Institute quantifies positive effects on biodiversity, soil, water and air quality. This data not only strengthens sustainability reporting for buyers but also proves the environmental contribution of Dutch-grown protein crops—turning transparency into an economic asset.

In 2025, the organisation counts around 120 member farms, producing approximately 250 tonnes of pulses on 130 hectares under long-term "New Deal" contracts. Over the coming years, Dutch Protein Farmers aims to scale to 400 members by 2030, producing over 4,000 tonnes from more than 1,300 hectares. That expansion will be accompanied by the introduction of the *Dutch Protein Farmers* label, set to appear on supermarket shelves in 2026 to help consumers recognise and choose products that reward local growers fairly.

The story of Dutch Protein Farmers demonstrates that fair pricing, data-driven sustainability, and collective ownership can turn protein diversification into a viable business model for farmers. By redesigning value chains instead of simply producing more, they make sure each additional step of processing strengthens—not sidelines—the people who grow the crop.

Box 14: Case study of The New Milk Farm

The New Milk Farm: Tapping into the opportunity of the plant-based market to diversify

Tom and Bart grew up on their family's farm near Enschede in the Netherlands, where dairy had set the rhythm for generations. During their studies in Wageningen and Amsterdam, they saw demand for plant-based milk surge in cafés and among friends. In 2017, they acted on an idea that had been germinating for years: produce soy milk alongside dairy. That was the start of De Nieuwe Melkboer (The New Milk Farm).

Early on, they set aside 0.5 out of their 80 hectares to grow soy for food use, steering away from the low prices in feed and the challenge of competing with GMO imports. The learning curve was steep—varieties, cleaning, hydration, flavour—but hands-on trials turned harvests into soy milk and eventually yoghurt via on-site fermentation. After four seasons of experimentation, provincial funding enabled investment in processing equipment and their first commercial production. As Bart recalls, "In the beginning, we would drive to Amsterdam twice a week to deliver our products." Being the first Dutch producer of soy milk generated media attention that eased their entry into the market.

In 2022, they prepared a growth plan and sought a partner. Their long-standing membership with the dairy cooperative FrieslandCampina (RFC) helped secure support: RFC already knew the family and saw the strategic potential of a credible, farmer-led entry into plant-based. "They had known us for years from being a member with our dairy cows, so they already trusted us, and quickly saw the potential of our business to enter the market," says Bart. As the yoghurt line scaled, running a full dairy alongside it became unsustainable. The family made the hard, emotional choice to sell the herd and focus their time and capital entirely on the new venture, aligning the farm's activities to the vision and desire to experiment of the new generation.

The market started to validate the bet. National retailers and food-service companies step-by-step became key customers, keen to back a local supplier and offer protein- and fibre-rich products. Today, soy covers eight times more land area (4 hectares) than when Tom and Bart started, achieving ~ 2.8 t/ha, which they transform into 120 K litres of yoghurt every year by complementing their own harvest with other Dutch production to meet the demand. "The current yields we get are sufficient, but we are very excited by the ongoing development of new varieties better suited to our climatic conditions, which will most likely further increase yields," explains Bart.

The story of De Nieuwe Melkboer shows how modest, well-timed support—in the form of processing-equipment grants, cooperative finance, and clear routes to market—can de-risk diversification. Crucially, Tom and Bart spread down the value chain: instead of selling soy as a commodity, they process and sell a branded product, capturing transformation margins and steadier cash flow through buyer contracts. That shift typically means a multiple-higher gross margin per hectare than raw-bean sales alone, more value retained locally, and a stronger business case for farmers to diversify. Today, the two brothers are an inspiration for many farmers in the area, encouraging them to follow their entrepreneurial instincts.

Box 15: Case study of Favamole

Favamole: When farmer and chef instincts meet to create a delicious fava beans spread

Favamole was born out of a desire for sustainable guacamole and a discovery of the local potential of fava beans. Farmer-chef Andrés wanted Dutch fava beans to earn a place on people's plates. Noticing the local enthusiasm for guacamole, he set himself a challenge: create an alternative that's just as tasty but built from ingredients that grow well in the Netherlands. After many trials and tastings with friends and family, the Favamole recipe was set.

From the outset, Andrés avoided commodity channels and worked directly with local organic farmers willing to experiment with fava beans. "The farmers are easy to convince because of the direct benefits they bring to the soil," he says. Growers chose varieties suited to their soils and microclimates, provided they meet taste and processing requirements. That flexibility kept agronomy grounded in reality while still hitting a clear quality spec for production. Several farmers went a step further, investing in basic processing equipment so the cleaning could happen on-farm. Instead of selling undifferentiated grain, they delivered value-added beans directly to Andrés, improving farm margins and strengthening the business case for legumes.

From 2 partnering farmers at the start, Favamole now works with 4 farmers across the Netherlands, collectively dedicating ~20 hectares to fava bean cultivation. This growth shows clear momentum as trust and proof of concept have strengthened. The annual output is roughly 50 tonnes of dry beans, harvested in late summer. After soaking and cooking, the beans triple in weight to about 150 tonnes ready for production. Since fava beans make up ~40% of the final product, current supply supports ~375 tonnes of Favamole per year. Andrés expects this capacity to grow as the company further expands from food service into retail, an expansion which is well underway as Favamole recently made the listing of 2 major wholesalers in the Netherlands.By partnering farmer-to-producer, Andrés has cultivated a trust-based network of Dutch fava bean growers who share knowledge, experience, and equipment. Knowing they have a reliable buyer at a fair price has been a tipping point for many to include fava in rotation—capturing the soil-health benefits while improving income stability.

Environmental performance has been crucial from day one. Direct sourcing gives Andrés traceable, farm-level data and visibility over the production line—covering water use (~100-300 L/kg – mostly rainfall), nitrogen fixation (100-300 kg of Nitrogen/ha), carbon emissions (0.86 kg CO_2 e/kg) and spoilage rate (below 5%). These data points matter to Favamole's customers, who want to meet their sustainability and reporting targets and increasingly value verified, local supply chains.

The Favamole story shows how simple but smart design—clear quality specs, direct contracts, and modest on-farm processing—lets farmers move down the value chain. Crucially, it starts with a delicious, familiar recipe that consumers love; great taste creates demand for fava beans, which in turn anchors predictable offtake and fair prices. By cleaning/dehulling on-farm and selling differentiated beans into a branded product, growers capture more value than from raw commodity sales, Andrés secures consistent quality, and buyers get a credible, lower-impact, locally sourced option.

Box 16: Case study of LeguDash

LeguDash: Turning scattered data into a reliable source of truth for farmers and other actors of the legumes value chain

LeguDash was born 3 years ago from a simple but pressing problem: data on legumes exist, but it is scattered, delayed, or too general to guide real decisions. For farmers, processors, and advisers, that meant planning production and contracts with only half the picture.

To fix this, the South Westphalia University of Applied Sciences in Soest joined the LeguNet project to build a public dashboard that pulls together numbers for soybeans, fava beans, lupin, and peas. Prices, yields, sown areas, volumes, and trade flows were gathered from Eurostat, regional statistics offices, and specialised providers, then translated into clear, usable visuals. A special feature within the dashboard is the Soester Legume Index (SoeLi), developed by the team specifically for this use case. Using regression analysis, SoELI generates price forecasts for different legume crops. From the start, farmers were a primary user: questionnaires and field visits shaped the graphs, update cadence, and filters so they match on-farm decisions—what to sow, where, and at what risk.

Today, a working prototype is ready and slated for integration into official government websites. The pilot already improves visibility along the chain, while also revealing a system gap: current statistics are often too coarse or too slow (e.g., national averages, annual lags) to support day-to-day choices. This remains a challenge for Member States and the EU to address if they want legumes such as fava beans to scale.

LeguDash is a modest but important step: it takes fragmented information, makes it usable, and gives the legume chain a clearer view of itself. This is something every farmer needs before committing to the next harvest. They created a shared, free of charge "source of truth" which reduces uncertainty, aligns expectations on price and volume, and unlocks commitments that grow the market.

Strategic outcome 4

Clear and enabling EU regulations on the usage of fava beans in food and feed support a wide versatility of use

Description of the strategic outcome state:
Food and feed companies have clear guidance on how to use fava beans, from science-based feed inclusion rates to harmonised EU food regulations.

This clarity enables innovation, giving processors confidence to develop new products. As a result, fava beans emerge as a go-to ingredient, from protein-rich dishes to premium feed rations.

Recommended policy actions for reaching the strategic outcome:

Policy Actions	Policy Vehicles
4.1 Set harmonised EU science-based guidance on measurement and communication of key anti-nutritional factors (ANFs) in food and feed, and harmonise testing protocols. For fava beans, focus on vicine/convicine, tannins, and lectins with guidance tailored to product category, processing method and intended use.	General Food Law Regulation (No 178/2002)
4.2 Support research, long-term feeding trials, and new processing methods to close knowledge gaps on use as feed. This includes understanding how different animal species are affected in terms of performance, health, and product quality, as well as how processing changes digestibility and what the recommended inclusion rates should be.	Post 2027 CAP – EIP Operational Groups, Competitiveness Fund (Horizon Europe)
4.3 Support the development of a standardised, time-efficient and cost-effective quality assessment method and grading system to facilitate the use in food products and feed formulations.	EU Feed Marketing and Feed Materials legislation, Post 2027 CAP

Box 17: Case study of potato protein

Potato protein:
A faster route to market without cutting corners on safety

Before the 2018 reform of the EU Novel Foods Regulation, there was a simplified authorisation route for foods with composition and nutritional profiles similar to what Europeans were already eating. Potato protein used that path, reaching the market much faster than a full dossier would have allowed, while ensuring food safety. After a few years of establishment on the food market in the early 2000s, the potato protein volume has increased roughly tenfold in the past 15 years, to reach ~ 10 kilotons today.

The lesson isn't that safety can be rushed, but that regulation can be proportionate to risk. For future fava bean-derived ingredients such as concentrates, isolates, and tailored fractions, it is important to have proportionate, risk-based regulatory pathways and clarity on novel food status. The potato-protein precedent shows how timelines can be shortened when products are demonstrably similar to established foods, while keeping safety rigor intact.

The balance of accelerated access to market paired with unchanged safety standards is what lets industry invest with confidence and consumers trust what's on the label.

Strategic outcome 5
Storage, distribution and processing infrastructure in the EU is well developed around key clusters of production, strengthening rural development

Description of the strategic outcome state:
In major growing regions, clusters of integrated hubs manage the storage and processing of fava beans for multiple product applications—ranging from whole food (fresh or canned) to milling, or the extraction of protein, fibre and starch. These clusters strengthen rural development by concentrating production and creating local value chains: farmers benefit from nearby facilities that preserve quality, while processors secure reliable, large-volume supply to justify investment in advanced technologies supported by harmonised specifications and quality assurance that enable cross-border procurement. By-products are valorised, making the system circular and profitable, with each hub attracting further innovation, business activity, and regional growth.

Recommended policy actions for reaching the strategic outcome:

Policy Actions	Policy Vehicles
5.1 Legumes should be included among the products eligible for support to invest in equipment and infrastructures such as processing and storage.	Annex I to the Treaty on the Functioning of the European Union (TFEU)
5.2 Mandate EIB and EIF to designate protein crop processing as a strategic priority to boost access to affordable financing, by designating protein crops as a priority for the EU across strategic files.	Multiannual Financial Framework (MMF)
5.3 Enable co-financing schemes for new large-scale protein crop storage and processing facilities in production hubs, strengthening rural development.	Competitiveness Fund, National and Regional Partnership Plans
5.4 Support research and investments in valorisation of by-products such as starch to maximise circularity and enhance profitability.	Competitiveness Fund (Horizon Europe), Post-2027 CAP – EIP Operational Groups, Circularity Act

Box 18: Case study on BENEO

BENEO
A new processing plant to scale fava bean ingredients for food & feed

Founded in 2007, BENEO has become a global ingredients player. The company is now active in more than 80 countries, with over 1,000 employees across 7 local offices and 7 production sites worldwide. Its core business is the development and production of functional ingredients from natural sources for food, animal feed and pharmaceutical products, bringing nutrition and technical performance together at scale.

Within plant-based proteins, BENEO focuses on wheat, fava bean and rice, a portfolio designed to serve both human and animal nutrition markets. For fava beans specifically, BENEO has invested heavily in R&D and application support to make fava bean protein easier to use in real-world formulations: from egg-free bakery and dairy alternatives (leveraging foaming and emulsifying properties) to protein-enriched foods where mild taste and low off-notes reduce the need for masking, and savoury applications where texture and process stability matter most.

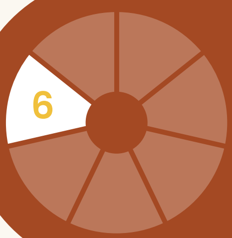
That innovation agenda is now matched by industrial capacity. In April 2025, BENEO inaugurated a new pulse-processing plant in Obrigheim (Germany), backed by an investment of around €50 million to process local fava beans into high-quality ingredients for both food and feed. The new site, built next to the existing BENEO sugar-processing site, is expected to generate about 25 new jobs, further strengthening the rural area.

Sustainability was a key driver behind BENEO's decision to select dry fractionation as a method for protein extraction. At the Obrigheim site, fava beans are turned into a protein concentrate and a starch-rich flour without the use of water, chemicals or processing aids. Compared to alternative protein extraction methods, this approach requires significantly less energy, helping to reduce the overall environmental footprint of production.

BENEO sources its fava beans directly from local farmers in Germany, close to the production plant. As they put it: "Supply is not a challenge for us. Farmers find growing fava beans very attractive and we manage to have a stable supply flow." All beans are REDCert2 certified, equivalent to the highest "Gold" level of the SAI Farm Sustainability Assessment (FSA).

The more uncertain part is the investment case for scaling processing in a volatile market. As BENEO notes, "The factory needs to run at maximum capacity to enable a fair return on investment", yet demand volatility for pulse-derived proteins can jeopardise utilisation rates and undermine the business case. This underlines the need for demand-side incentives that stabilise uptake, such as legume-oriented public procurement policies, supportive dietary guidelines, or promotion campaigns.

In parallel, de-risking instruments can help incentivise investments in infrastructure despite demand volatility while these demand measures ramp up. Tools such as more frequent alignment of public and private funding, or easier access to affordable financing, can alleviate part of the financial pressure, unlocking faster scaling not only for large incumbents, but also for smaller innovators building the next generation of fava-based value chains.



Strategic outcome 6
Public and private actors offer healthy, tasty and sustainable food options, leading to a high share of fava beans in European diets

Description of the strategic outcome state:
Legumes are a regular feature of everyday meals as updated procurement guidelines—aligned with national dietary recommendations—bring healthy, sustainable, local options to schools, workplaces, and hospitals. Culinary training and food innovation equip chefs to create appealing legume dishes across restaurants and ready-made meals, while retailers track progress and share best practices, embedding legumes in diets across society. Together, these measures generate sustained demand, reinforce Europe's strategic autonomy, and improve consumer health.

Recommended policy actions for reaching the strategic outcome:

Policy Actions	Policy Vehicles
6.1 Require Member States to incorporate Sustainable Public Procurement criteria – as proposed in the JRC study "Criteria for Sustainable Public Procurement" – in public contracts and tenders, steering consumer behaviour and stimulating the market's offer of healthy and sustainable products, while reflecting the Member State's dietary guidelines (see policy Action 7.1).	Public Procurement Directive
6.2 Fund Member States to update culinary curricula and chef training so foodservice, ready-meals, and restaurants can deliver healthy, appealing dishes with more fava beans and other legumes.	Public Procurement Directive, EU Promotion Policy (Reg. 1144/2014), Council Recommendation on Vocational Education and Training (VET)
6.3 Boost food innovation to support the development of easy-to-use legume products for kitchen chefs.	Competitiveness Fund (Horizon Europe)
6.4 Ensure that the menus of school canteens are aligned with national dietary guidelines, integrating locally-sourced legumes in regional gastronomy traditions.	Post 2027 CAP – Common Market Organisation – EU School Scheme
6.5 Fund an EU-wide programme to support retailers in monitoring and publishing data on their protein ratios, leading to a balanced range of higher quality plant-based and animal-based protein products	Single Market Programme (SMP)
6.6 Fund pilots and interventions of sub-national governments to strengthen their regional food environment and encourage scaling of sub-national policy innovations, initiatives and best practices to EU level by creating a dedicated focus on sub-national policy in the EU Policy Lab.	Competitiveness Fund, EU Policy Lab
6.7 Encourage cross-sector partnerships between food heritage organisations, chefs, and retailers to revive and modernise legume-based dishes.	Competitiveness Fund

Box 19: Case study of Sodexo Masterclass

Sodexo Masterclass: A training programme designed to make legume-based dishes an appealing choice for consumers

One of the ways Sodexo is working towards its Net Zero ambition is by continuously training and engaging its teams to deliver sustainable food options to clients and consumers. Sodexo has added a masterclass called "Vegetalising, driving a cultural shift" to inspire chefs and catering teams to continue incorporating more sustainable and healthy ingredients in menus, including whole cereals, pulses and vegetables, while developing consumer satisfaction.

The masterclass is built around three key objectives: developing a country-specific action plan to integrate sustainable eating into daily operations, promoting healthier eating habits among consumers and equipping chefs and food service teams with the skills to become trainers. Throughout the training, participants explore the importance of sustainable food, inspiring lasting changes in eating behaviours for the benefit of people, animals and the planet.

The content of this masterclass is the product of a strong collaboration between:
- **Sodexo teams** (Sustainability, Sodexo Academy, Chefs, Culinary team)
- **Humane World for Animals**, an animal protection NGO with which we worked for this project
- **Lenôtre Culinary School.**

Since its 2023 launch in Europe, the Masterclass has gone global with 8 countries already participating. In Belgium, more than 60 chefs and 130 food leaders have completed the programme, with visible ripple effects across schools, hospitals, and company restaurants.

The Sodexo Masterclass shows that demand starts with taste. Lasting dietary shifts happen when chefs are equipped to make legume-rich, plant-forward menus the most appealing choice. That requires skills rarely covered in standard curricula—sensory technique, menu design, and cross-team coordination—so the plant-based option wins on flavour first and sustainability follows naturally.

Strategic outcome 7

Fava beans are an easy, affordable and appealing choice for European consumers, backed by supportive dietary guidelines

Description of the strategic outcome state:
Fava beans and other legumes are affordable, widely available, and come in many forms—fresh, dried, canned, frozen, or as ingredients in ready-made products. National dietary guidelines and marketing campaigns encourage their consumption by reinforcing their role as healthy, nutritious, and sustainable choices. Altogether, this fosters the reconnection of people across the EU with fava beans as part of their food heritage. Retailers promote their taste and versatility, while recipes, videos, and influencers inspire home cooking. As awareness and simplicity of use grows, fava beans shift from niche to mainstream, with steady demand across the EU, all the while prioritising local production.

Recommended policy actions for reaching the strategic outcome:

Policy Actions	Policy Vehicles
7.1 Provide Member States with clear guidance to include a recommended daily share of legumes in the revision of their dietary guidelines to incentivise an increased intake of fibre and a shift to more sustainable protein.	EFSA Scientific Opinion on the establishment of Food-Based Dietary Guidelines
7.2 Fund campaigns to raise awareness on the health and sustainability benefits of fava beans and pulse rich diets. Embed heritage-based campaigns and storytelling in public procurement and consumer awareness initiatives, linking fava beans to historical narratives, regional gastronomy traditions and fun easy to make recipes.	EU promotion policy – AGRIP Promotion Fund, Annex I to the TFEU
7.3 Ensure the inclusion of legume-based products in Annex I to the TFEU to enable their promotion in EU-funded campaigns (See policy Action 7.2).	Annex I to the TFEU
7.4 Ensure that the denomination of legume-based products is clear and supportive of consumer adoption, permitting the use of terms such as fava bean "burger", "sausage" and "steak".	Post 2027 CAP – Common Market Organisation
7.5 Introduce marketing standards for protein crops for food and feed, including origin labelling.	Post 2027 CAP – Common Market Organisation
7.6 Integrate legumes into EU cultural and tourism programmes, positioning them as part of sustainable gastronomy.	Sustainable Tourism Strategy

Box 20: Case study of Nordic Nutrition Recommendations report

The Nordic Nutrition Recommendations report: Guiding member states towards healthy and sustainable dietary guidelines

In 2023, the Nordic Council of Ministers released the latest Nordic Nutrition Recommendations (NNR), the scientific backbone for dietary guidelines across the Nordic and Baltic countries. For the first time, pulses (including fava beans) were recognised as a stand-alone food group, no longer tucked under "vegetables." That simple taxonomy change matters: what gets its own category gets measured, taught, procured, and eaten.

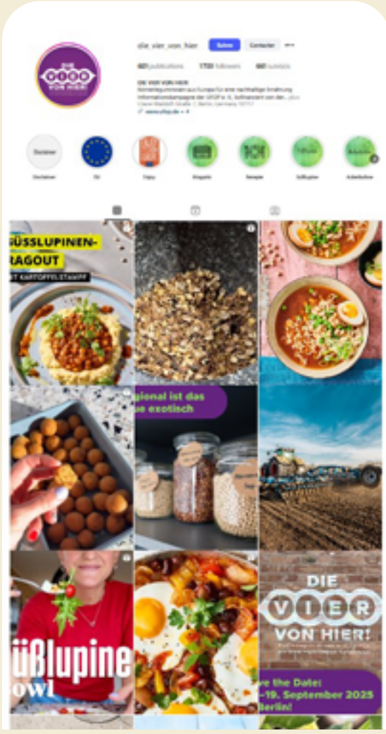
The shift rests on a rigorous review of evidence: as part of a balanced diet, pulses contribute to delivering high-quality protein, fibre, and key micronutrients. Legumes also have protective effects on established risk factors for cardiovascular disease and type-2 diabetes, although further research focus would be needed to set food-based dietary guidelines on chronic diseases. The NNR also integrates environmental data, pointing to lower greenhouse-gas emissions and soil benefits when pulses replace more carbon-intensive foods. The guidance is concrete: 200–300 g of cooked legumes per week, spread over 3–4 portions, a step-up from current averages.

Because NNR is the dietary reference for national authorities in Denmark, Sweden, Finland, Norway, Iceland, Estonia, Latvia and Lithuania, its recommendations cascade into policy and practice. Once pulses stand on their own in the science, they become easier to include in school meals, hospital menus, and public procurement standards, and simpler to reflect in front-of-pack labelling, menu planning, and culinary curricula. For consumers, the message is clearer: eat pulses regularly, just as you would fruit, vegetables, or whole grains.

The NNR recommendations reports shows that clear, science-based guidance can pull demand through the system. By giving pulses a visible place on the plate, the Nordics created permission and direction for caterers, retailers, and manufacturers to reformulate and feature pulse-based dishes, making fava beans and other legumes a natural, locally suited choice rather than an occasional alternative. That demand signal, amplified by public procurement and menu standards, helps normalise beans in everyday diets and de-risks upstream investment for farmers and processors.

Box 21: Case study the Four From Here

“The Four from Here – Grain legumes from Europe for sustainable nutrition” Giving European legumes a face and a story via the EU Promotion Policy



In February 2024, a new campaign was launched across Germany and Austria with the goal to give legumes a regular place on people’s plates. True to its name, the campaign spotlights four varieties of legumes: fava beans, grain peas, sweet lupins, and soy, and explains the nutritional, cultivation and environmental benefits of legumes to consumers encouraging them to use them more often at home.

The Union for the Promotion of Oil and Protein Plants (UFOP) runs the campaign, which is 80% financed by the EU Promotion Policy over a three-year period. The campaign combines broad reach with practical, repeatable touchpoints. It activates multiple channels and multipliers such as social media, blogs, journalists, and health practitioners, to keep messages consistent and visible. On Instagram and Facebook, the team posts appealing recipes featuring pulses and pulse-based processed products, along with short reels that lower the barrier to cooking at home. These posts provide followers with regular inspiration, practical cooking tips, and information on the positive effects of cultivation on agriculture, the environment, and nature. Meanwhile, the campaign’s website curate easy-to-digest articles summarising recent studies and news on legume production and consumption, helping audiences connect taste with nutrition and sustainability. Media outreach keeps legumes in the public conversation, while engagement with health professionals amplifies credible guidance in everyday diet advice.

The campaign is based on the idea that awareness and knowledge come first and that taste is the gateway to improving the image of the four pulses and increasing demand. By making European-grown legumes visible, delicious, and easy to cook, the campaign nudges consumers to prepare pulses and pulse-based products at home and order them at restaurants. This shifts behaviour from occasional trial to routine use in everyday diets, and de-risks upstream investment for farmers and processors.

3.2. The role of private sector action to drive the fava bean transition

The success of the fava bean sector will not be driven by policymakers alone. Policies can create the enabling environment, whereas the private actors across the value chain will need to act to develop the sector. This roadmap sets out a series of recommendations to make the policy landscape more conducive to developing the fava bean value chain. Enabling, supportive policies are essential – but they are not sufficient on their own. Actors along the entire chain will also need to seize investment opportunities and take calculated risks. Box 22 highlights a concrete example of the private sector leveraging the policy framework for sector growth.

Moving beyond today's "chicken-and-egg" stalemate will require each link in the chain to step up in its own way. At the start of the chain, input companies play a crucial role in understanding the needs of both farmers, processors and consumers, and in developing solutions tailored to fava beans. Breeders need to look beyond the limited cultivated area and market signals and invest in targeted breeding programmes. By collaborating with peers to co-invest and pool knowledge, breeders can help ensure that higher-yielding, more resilient and end-user-oriented varieties are developed and translated into commercially viable solutions more quickly.

With a more complete toolbox in the making, farmers are well positioned to provide stable volumes through the chain. Their success, however, depends on their ability to secure offtake at a fair price and access high-quality, well-adapted varieties that meet processors' quality requirements.

By organising into producer organisations, farmers can share agronomic knowledge, pool equipment and negotiate from a stronger position, improving both their resilience and profitability. De-risking incentives for farmers – such as the Risk Transition Payments proposed in the 2027 CAP reform – should be used as a means to soften the transition to legumes rotations, as outlined by Mathias, Thomas and Max (Box 22).

Once a stable inflow of materials reaches processors, they need to develop high quality products that meet the needs of the market, confident that retailers and food service companies will run down their stocks. This requires investment in new infrastructure so processing capacity can grow in line with supply rather than becoming the bottleneck. Processors can further strengthen their business case by valorising by-products, creating additional income streams that make fava bean-based value chains more resilient.

In turn, retailers and food services can reinforce this dynamic by integrating fava bean-based products into their assortments, supporting co-investments in processing capacity and sending clear, long-term market signals that reward sustainable sourcing from European value chains.

To break the vicious cycle that keeps fava beans a minor crop, coordinated action and investment will be needed at every step of the chain. This can take the form of public–private partnerships, but also of direct co-investments between value-chain actors—for example, retailers helping to finance processing equipment for an agricultural cooperative in order to later offer those products on their shelves. In parallel, research agendas should be aligned to avoid duplication, and expertise and outcomes should be pooled in ways that move the entire value chain forward. A faster and more ambitious expansion of the sector would ultimately benefit all actors involved.

Box 22: Examples of how farmers would use the CAP risk transition payments to de-risk legumes cultivation

How risk transition payments can incentivise legumes cultivation

"Risk transition payments" were introduced in the CAP post-2027 proposal submitted by the European Commission in October 2025. These payments of up to €200 000 aim to support farmers who maintain or transition to more sustainable farming practices. They offer a powerful lever to increase the share of legumes on European fields by helping farmers both invest in equipment and buffer potential income losses when starting to cultivate the new crops.

When Mathias Pedersen (Box 5) decided to grow more legumes for the Danish food market, investments in on-farm infrastructure were unavoidable to reach the quality and prices needed for profitability. Favourable pig prices in that year enabled them to get going, but securing capital to renew and expand equipment remains a challenge, one that risk transition payments are well placed to address.

Thomas Huybrechts (Box 7) also sees great potential in this proposition incentivising to grow more legumes on their dairy farm in Belgium. On top of helping them acquire the needed equipment – not an easy investment to make for a small farm like theirs – such a payment could cover potential financial losses caused by yield variability, effectively removing one of the biggest downsides of cultivating legumes.

Max Schulman (Box 8) looks at it on a meta level: he points to transition payments as a useful trigger for stable supply, paving the way for the whole chain to invest. Equally, he stresses that farmers need the right tools to reach profitability without ongoing support—through targeted breeding, practical crop-protection options, risk management tools and investments along the value chain.

Box 23: Case study of the French wine sector using CMO article 210a (48)

Leveraging CMO article 210a to increase collaboration amongst value chain players via competition-rules exemptions

Adopted under the 2023-2027 CAP reform, article 210a of the CMO Regulation aims to facilitate cooperation within agricultural value chains by allowing certain otherwise restrictive agreements between actors to be exempt from the competition-law prohibition. This article can only be used when waiving the restrictions is indispensable to achieve sustainability standards that go beyond mandatory EU or national rules.

This article has seldom been used, but in 2025, the French wine sector showed how this can work in practice. In Occitanie, organic and "Haute Valeur Environnementale" wine producers and their buyers used Article 210a to set indicative "orientation prices" designed to cover the additional costs of meeting those sustainability standards.

A comparable fava beans agreement could help fava beans move from niche volumes to reliable supply. Under a 210a agreement, producer groups, collectors, processors and retailers could jointly adopt a low-input fava standard pointing towards, for example, stricter pesticide-use rules, and soil management and protection practices. To make this viable at farm level, the agreement could pair the standard with collective offtake commitments and risk-sharing with multi-year volume windows, clear quality specs, and a jointly governed mechanism to handle downgrades/rejections for food-grade lots. Finally, it could unlock scale through joint investment in cleaning, sorting, drying and storage, financed via a small per-ton levy or remium paid only for verified product.

Article 210a can turn voluntary coordination into an investable, de-risked pathway for sector growth, but leveraging its potential is a value chain-driven initiative.

4. Outlook of a strengthened protein crop sector

Implementing the proposed strategic outcomes strengthens farmer profitability and resilience across both food and feed applications. Production is projected to double by 2040, with growth equally distributed between feed and food markets, translating to approximately one fava bean serving per person per day. This expansion generates measurable gains across critical EU priorities: reduced dependence on imported protein and fertilisers, improved public health through increased fibre consumption, enhanced soil health and biodiversity, and stronger farm incomes.

4. Outlook of a strengthened protein crop sector

An enabling and supportive policy landscape for legumes coupled with private sector action has the potential to shift our protein system to be more resilient, competitive, healthy and sustainable, while supporting farmer livelihood.

Implementing the actions outlined in sections 3.1 and 3.2 will lead to a stronger case for fava beans, and for other protein crops. To provide perspective on potential outcomes, the expected impact has been quantified by modelling the seven strategic outcomes. The projection on yield, costs, prices and consumption over the next 15 years (up to 2040) was modelled to ather an outlook on **3 key angles:**

1: farmer income

2: production and consumption volumes, and

3: other key macro effects such as healthcare costs, strategic autonomy and sustainability.

The modelling effort was supported by Systemiq and Wageningen University and Research. A detailed overview of the methodology can be found in the Appendix.

4.1. A stronger business case for farmers

Any attempt to model farmer income across Europe must acknowledge significant limitations. Farmer profitability depends on social and geographical context, agricultural practices, crop rotations, land costs, weather events, and numerous other variables that cannot be fully captured in a single framework. This roadmap provides a high-level overview of the directional effect of cultivating fava beans across different political contexts and regional scenarios, but it is not—and cannot be—a definitive business case for any individual fava bean farmer across the EU.

To structure the analysis, seven scenarios and three farm archetypes were modelled over a 15-year timeframe (2025–2040). The 15-year period is critical because sector transformation requires sustained investment and cannot be rushed. The scenarios reflect different end-uses of fava beans (feed, dried food, fresh food) and compare outcomes under business-as-usual conditions versus implementation of the strategic outcomes (see Table 2). The farm archetypes represent three different types of operations with distinct economic realities across Eastern and Western Europe. Data on operating costs, overhead costs, prices, yields, and subsidies were sourced from scientific literature, EU datasets, and interviews with farmers and experts.

Seven scenarios were used to model different uses of fava beans, with and without the effect of the strategic outcomes. The first scenario is the baseline rotation with wheat-barley-oilseed rape-wheat-maize-oilseed rape. The six other scenarios assume fava beans replace oilseed rape in the rotation, with different end-uses: feed, food (dry), and food (fresh). For each end-use, one scenario assumes business as usual, while the other assumes implementation of the strategic outcomes. Dry fava beans are assumed to occupy one-sixth of farmland, while fresh fava beans—reflecting their smaller market size—are integrated into only 20% of the rotation land. In the food (dry) scenario, it is assumed that 30% of the harvest is sold as feed-grade, reflecting the lived realities of farmers interviewed.

The three farm archetypes represent different farm types and regional contexts:

- **Archetype 1:** Large-scale arable farm of 100 hectares in Western Europe, integrating fava beans as a rotational break crop in intensive systems with high mechanisation and input access; dry and fresh beans are sold into food and feed commodity markets.
- **Archetype 2:** Large-scale arable farm of 100 hectares in Eastern Europe, integrating fava beans as a rotational break crop in intensive systems with high mechanisation and input access; dry and fresh beans are sold into food and feed commodity markets.
- **Archetype 3:** Mixed crop–livestock farm of 50 hectares, growing fava beans for on-farm feed to partially replace imported soy meal and wheat in the feed mix.

While these archetypes do not distinguish between organic, regenerative and conventional practices, it is worth noting that integrating legumes into organic and regenerative systems—which use little to no chemical inputs—can deliver even greater agronomic and economic benefits.

Table 2: The seven scenarios modelled for farm profitability

	Business-as-usual			After implementation of the strategic outcomes		
Rotation without fava beans (baseline) **Wheat-barley-oilseed rape-wheat-maize-oilseed rape**	**1: Baseline**			**Unaffected**		
Rotation including fava beans **Wheat-barley-oilseed rape-wheat-maize-fava beans**	Feed-grade price **2: Feed**	Food-grade dried price **3: Food**	Food-grade fresh price **4: Fresh**	Feed-grade price **5: Int.Feed**	Food-grade dried price **6: Int.Food**	Food-grade fresh price **7: Int.Fresh**

The profitability impact of replacing oilseed rape with fava is driven by two mechanisms: **the replacement effect** and the impact of **strategic outcomes.**

The replacement effect

When fava beans enter the rotation, immediate benefits materialise. Fava beans require less nitrogen fertiliser than oilseed rape for both themselves and the subsequent crop (wheat), due to its nitrogen-fixing capability. Fava beans also require fewer pesticides and has lower overhead costs. However, fava beans generate lower revenue per hectare than oilseed rape because of lower yield potential and market price.

Strategic outcomes

The proposed interventions in Section 3 drive profitability through:

- (i) a 31% expected yield increase over 15 years as agronomic expertise spreads and new varieties are adopted[2] ;
- (ii) increased subsidies via coupled income support ;
- (iii) higher selling prices as farmers gain stronger bargaining positions through better organisation (see Figure 17).

[2] As a reference, fava bean yields have increased by 31% between 1990 and 2010 (23)

Figure 17: Impact of strategic outcomes 1, 2 and 3 on farm profitability

Strategic outcomes	Impact on farm profitability
1 Applied research and on-farm trials generate the varieties, inputs, tools, and agronomic guidance farmers need to achieve target yields and harvest quality across different production methods	**Yield increase of 31,25%** after 15 years of focused breeding and increased farmer knowledge
2 European farmers are supported to start cultivating legumes, and rewarded for the resulting societal benefits	**Increased direct income** for farmers from targeted subsidies
3 Value chains across the EU are strongly coordinated, and fava bean farmers are well organised and effectively supported for production, processing, and contracting	**Higher selling prices** due to increased valorisation of products and more strategic positioning of farmers on the market

In the business-as-usual scenario, only fresh fava beans show a clearly positive business case by 2040. For feed and dried food, outcomes are break-even or marginal, too weak to incentivise widespread adoption. This underscores why the strategic outcomes are essential: without them, market forces alone will not drive sector transformation.

With the strategic outcomes implemented, profitability improves significantly by 2040: a 15–35% increase depending on region and end-use. Food-grade beans show the strongest gains, while feed reaches parity with the baseline (Figure 18). These results depend entirely on the emergence of developed markets and sustained demand growth.

It is critical to understand the specific drivers of profitability change, illustrated in Figure 19 and Figure 20 [3] for fava beans grown for food in a Western European farm by 2040:

- **Drop in overhead and set-up costs** due to lower machinery and seed costs compared to oilseed rape.
- **Drop in operating costs** due to lower fertiliser needs for fava beans and the subsequent wheat crop, as well as lower pesticide use for fava beans than oilseed.
- **Lower revenue per hectare** for fava beans than for oilseed, even after accounting for the price and yield impacts of strategic outcomes.
- **Higher subsidies** through crop-specific coupled income support for fava beans, which are higher than those for oilseed.

[3] Similar graphs for farm archetypes 2 and 3 can be found in the Appendix.

Figure 18: Farm profitability across archetypes and scenarios

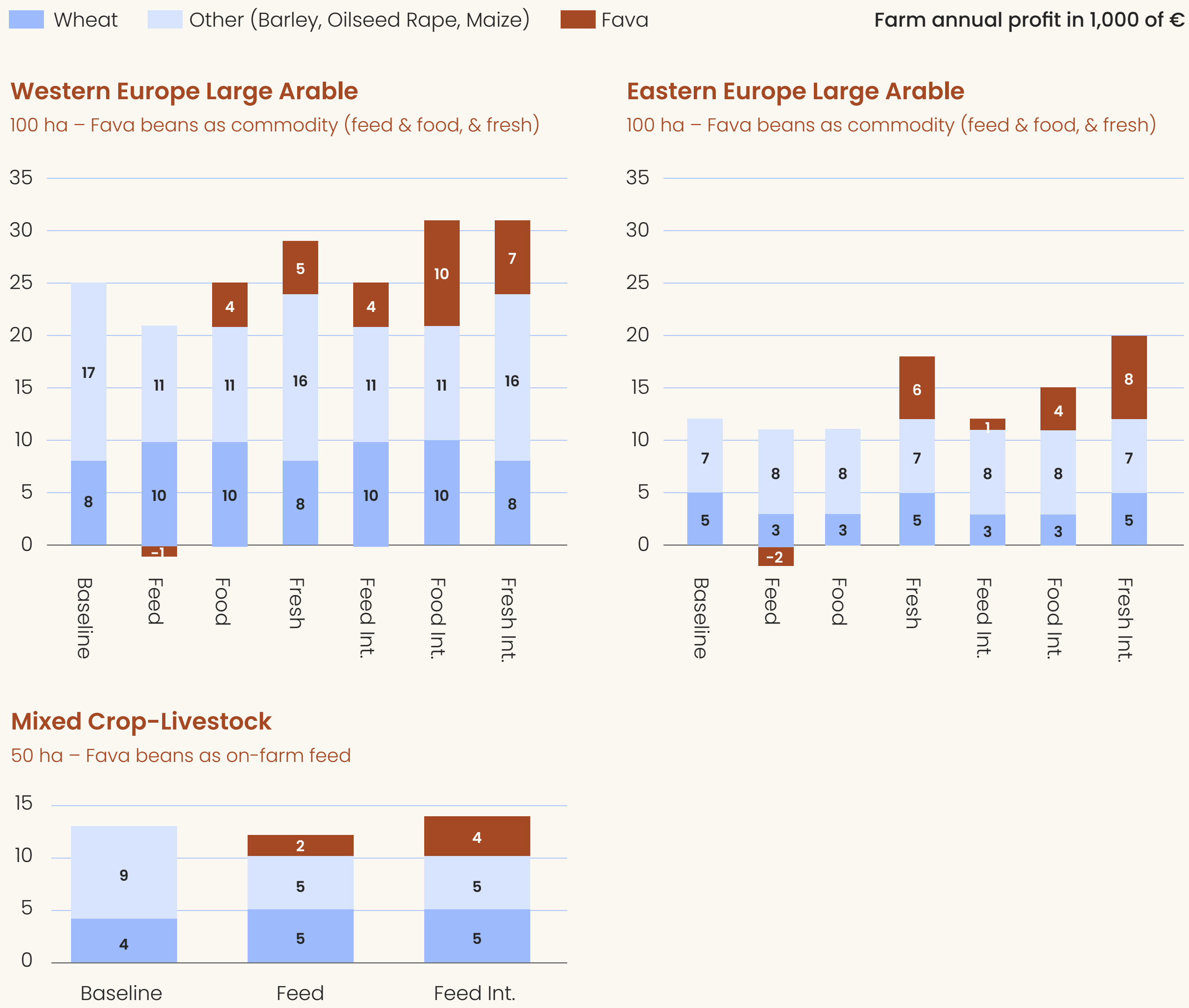


Figure 19: Evolution of cashflow for 100ha Western European arable farm (Archetype 1)

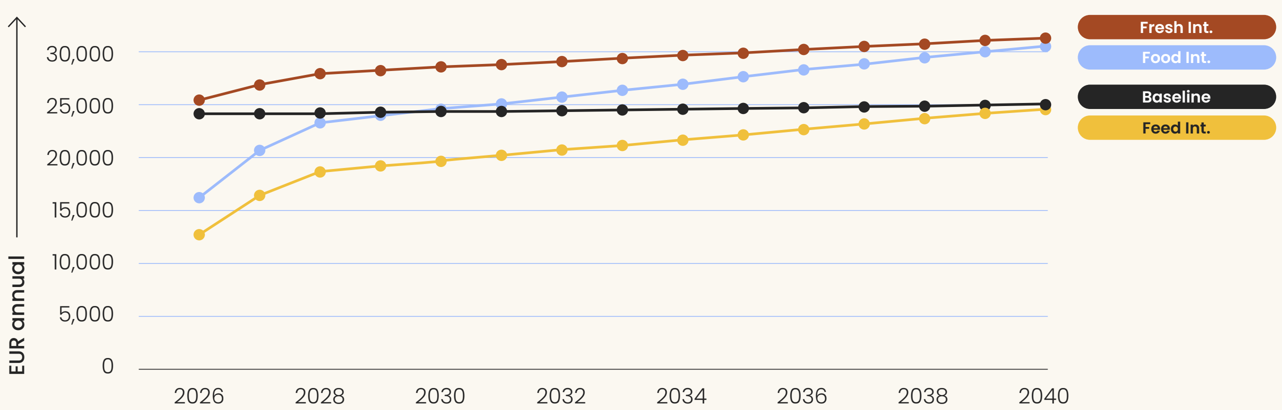
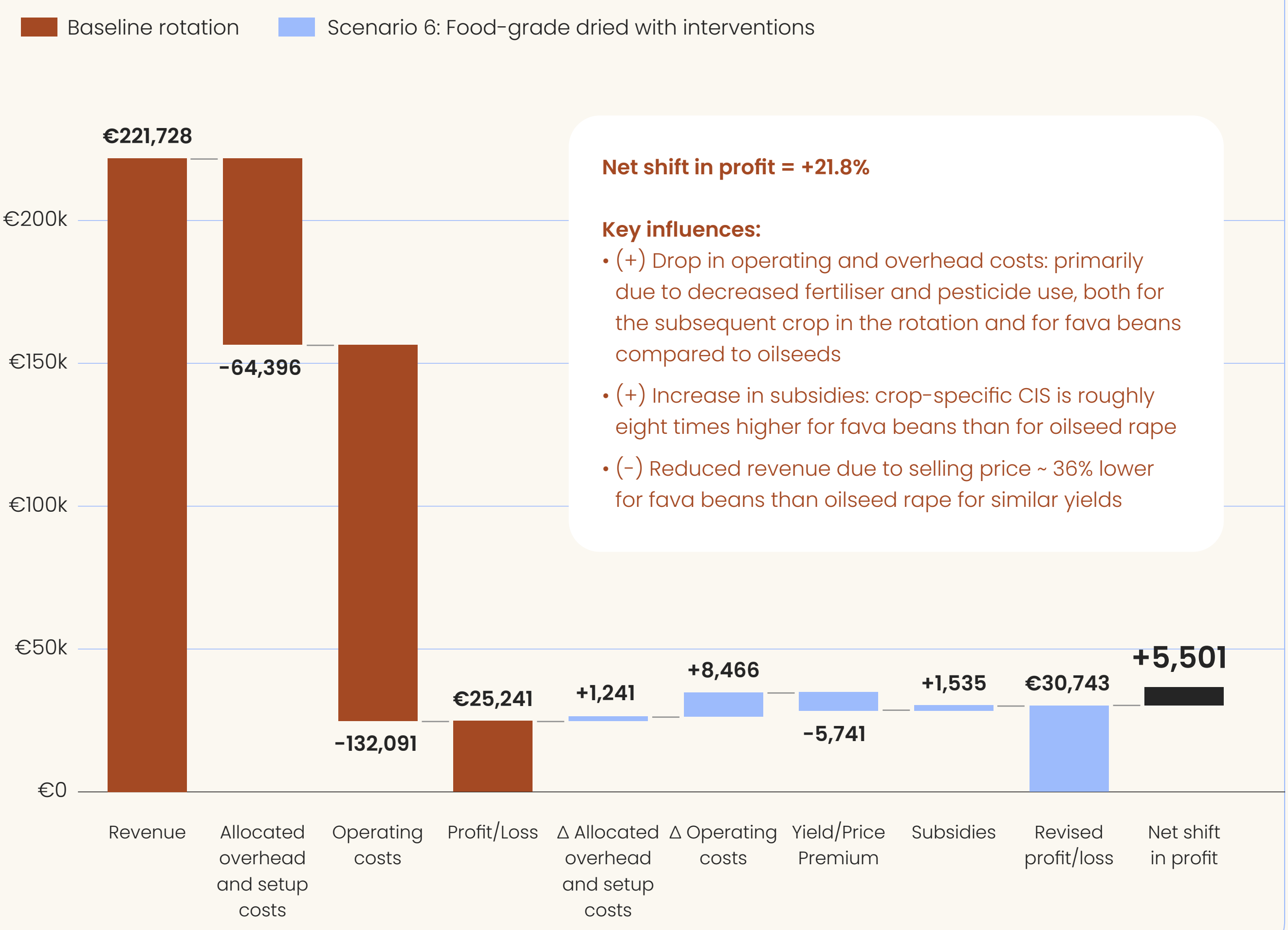


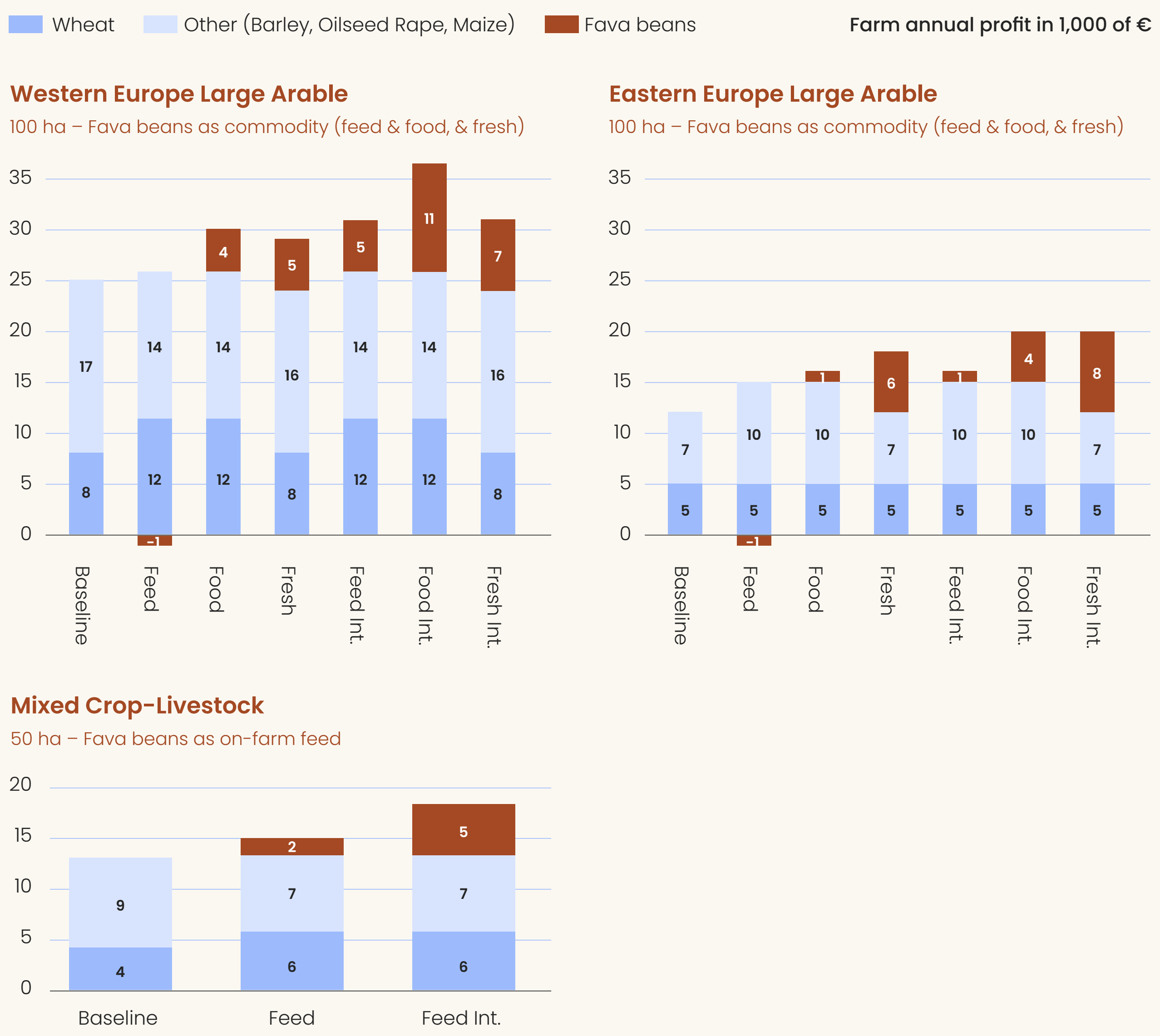
Figure 20: Shift in profitability for a 100ha Western European farm, introducing fava beans to be sold as food (dried)



It is important to look beyond the end-point of 2040 projections and examine the evolution of profitability over time. As show on Figure 19, a profitability dip compared to the baseline occurs in the first year for all scenarios except fresh fava beans, reflecting a necessary transition period. This dip is the result of two factors: (i) lower yields in the first 2–3 years as farmers overcome knowledge gaps and scale agronomic practices, and (ii) the delayed capture of benefits from reduced fertiliser use for the subsequent crop (recognised only from year two onward). Importantly, the strategic outcomes modelled in this roadmap are assumed to unfold gradually over the full 15-year period (2025–2040), not immediately. Yield improvements, market organisation, processing infrastructure, and demand growth all require time to materialise. This is why the temporal perspective matters: it shows that profitability emerges not suddenly at 2040, but through multiple years. This early-period risk is precisely why transition support is essential. Without it, farmers lack the financial cushion to weather the initial downturn, and sector growth stalls before structural improvements take effect.

To bridge this profitability gap, financial rewards for environmental benefits (€52/ha in the modelled scenario – Figure 21) can provide immediate revenue that offsets transition risks. Such payments—similar to those already in place in several Member States—reward the ecosystem services delivered by fava bean cultivation (soil health, nitrogen fixation, biodiversity). Equally important, the “risk transition payments” proposed by the European Commission for the CAP post-2027 would allow farmers to maintain positive cash flow and to invest in processing machinery improving their business case Importantly, modelled results show that such payments are primarily needed during the first phase, not indefinitely. Once structural interventions (better varieties, market organisation, processing capacity) mature, standalone profitability emerges demonstrating the roadmap’s core promise: de-risking farms can lead to durable business cases.

Figure 21: Farm profitability across archetypes and scenarios with an additional subsidy of 52€/ha across farmland



The theoretical profitability reached by farmers across archetypes depends on the emergence of a developed market and sufficient demand. By 2040, the net shift in profit is projected to be positive for cultivating fava beans for both food and feed, with an even stronger case for food-grade beans, in line with today's market realities. However, despite careful efforts to ensure data accuracy, the assumptions required to bridge data gaps and unknowns, as well as the simplified nature of the archetypes, mean that these results remain highly theoretical. Realising this profitability in practice also requires dependable offtake agreements for farmers, which itself depends on a sustained rise in demand. The anticipated effect of the proposed actions on consumption levels has been modelled, and the results are presented in section 4.2.

4.2. More legumes on European plates and barns

Demand is essential to secure offtake and drive investments across the value chain. The projected increase fava bean consumption by 2040 results from three drivers: enabling regulatory guidance, higher indirect intake, and higher direct consumption by European consumers. An overview of how the strategic outcomes impact demand is shown in Figure 22. While strategic outcome 5 does not directly impact demand, the proposed actions are crucial to ensure the sector has the needed capacity to grow.

Figure 22: Impact of strategic outcomes 4, 6 and 7 on demand

Strategic outcomes	Impact demand
4 Clear and enabling EU regulations on the usage of fava beans in food and feed support a wide versatility of use	**Increased confidence** to integrate fava beans and derivatives into food and feed applications thanks to enabling regulatory guidance
6 Public and private actors offer healthy, tasty and sustainable food options, leading to a high share of fava beans in European diets	**Increase indirect consumption** from the integration of fava beans in food service meals and supermarkets, backed by public procurement guidelines
7 Fava beans are an easy, affordable and appealing choice for European consumers, backed by supportive dietary guidelines	**Increased direct consumption** due to more promotion and increased knowledge on benefits, backed by dietary guidelines

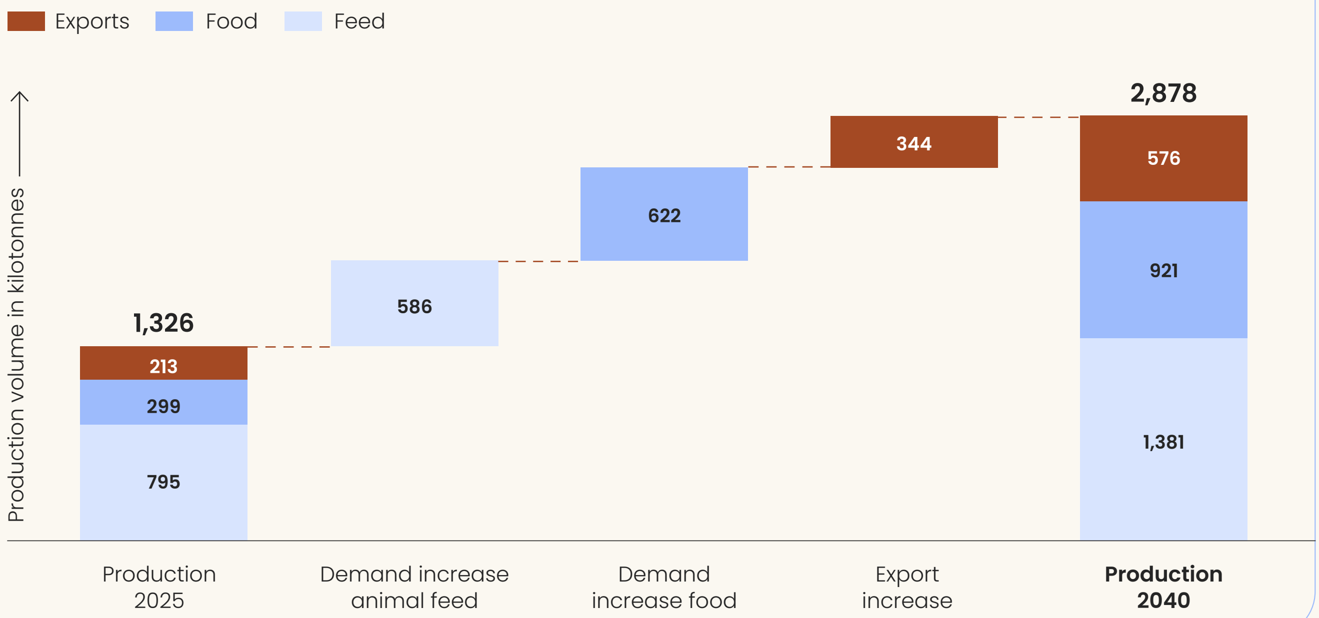
The total demand for fava beans is expected to roughly double by 2040, with 48% destined for feed, 32% for food, and 20% for export (Figure 23).

- **For food:** The growth of 250% has been modelled based on existing successful initiatives combining private and public effort to drive commodity adoption—such as Denmark's wholegrain partnership, which doubled wholegrain intake in a decade [4]. This rise translates to approximately one fava bean per person per day across the EU.

- **For feed:** The total growth of 174% assumes reaching a 60% feed and 40% food split in domestic consumption, reflecting the established market structure of comparable legumes such as peas.

- **For export:** Export is modelled as a relatively stable share of approximately 20% of total production.

Figure 23: Expected shift in EU production, consumption and export volumes by 2040



This demand growth would require roughly 360,000 additional hectares of production, potentially enabling around 30,000 new farmers to build a positive business case with fava beans by 2040. Assuming adoption across both arable and mixed farms, the expected increase in production translates to fava bean integration in rotations on approximately 30,000 farms across the EU. This expansion carries significant co-benefits: substantial gains in soil health and human health, reduced costs for fertiliser and feed imports, and lower dependence on geopolitically volatile supply chains.

[4] The projected annual growth rate for fava beans in the food segment assumes a trajectory comparable to the decade-long surge in quinoa demand.

4.3. Positive macro effects

Increasing the volume of fava beans produced and consumed in the EU delivers significant macro benefits by 2040 across three dimensions: strengthened strategic autonomy, lower healthcare costs, and reduced environmental impact. An overview of these benefits is shown in Figure 24.

Strategic autonomy is strengthened through a reduction of 63,000 tonnes of annual chemical fertiliser needs and 350,000 tonnes of annual protein meal imports. The projected increase in fava bean production would reduce the need for chemical fertilisers by 63,000 tonnes annually, a result of fava beans' capacity to fix nitrogen in the soil. Simultaneously, increased fava bean production for feed—the largest end-use—would reduce imports of high-protein meals from the Americas by 350,000 tonnes, equivalent to 1% of total EU protein meal imports. This direct substitution insulates European agriculture from geopolitical volatility and price shocks in global commodity markets.

Healthcare costs decline by €42 million annually through increased fibre consumption from fava beans. Fava beans are significantly higher in fibre than the average protein source currently consumed in European diets. Assuming the increased fava beans for food replace current protein consumption on a gram-for-gram basis, the result would be a substantial increase in fibre intake per person per year. This reduction in low-fibre diets would lower the incidence of cardiovascular disease and type 2 diabetes, delivering the quantified healthcare savings.

Environmental impact is reduced by 7 million tonnes of annual CO2e emissions and 209 tonnes of annual pesticide use. Fava beans have lower average greenhouse gas emissions than the current EU protein mix; increasing their share in diets proportionally reduces emissions. Additionally, replacing soy and wheat in livestock feed rations further cuts CO2e emissions. Finally, fava beans require fewer pesticides than the crops they replace in both food and feed production, reducing agricultural chemical inputs.

These quantified benefits represent only the result of supporting the fava bean value chain. Given that the recommendations in this roadmap would largely benefit the broader protein crop sector across the EU, the total impacts from systemic transformation are expected to be significantly higher.

Figure 24: Annual macro effects from expected increase in fava beans consumption by 2040

63k tonnes
Avoided fertiliser application

27m euros
Reduced fertiliser imports

350k tonnes
Reduced import of protein meals

42m euros
Avoided healthcare costs

7m tonnes
Avoided CO_2e emissions

209 tonnes
Avoided global pesticide use

5. Final words

Europe stands at a defining moment for its agriculture and food system. The fava bean, Europe's oldest legume, represents far more than historical legacy. It offers a pathway forward to address the interconnected crises facing our agri-food system: declining strategic autonomy, rising health burdens, environmental degradation, and persistently low farmer incomes. Yet realising this legume's potential requires immediate, coordinated action across the entire value chain.

The evidence is compelling: fava beans can deliver tangible benefits across multiple dimensions. They can strengthen Europe's protein system, breaking our dangerous dependence on imported feed and fertilisers that leave farmers and communities vulnerable to geopolitical shocks. They can prevent diet-related disease that currently costs healthcare systems billions annually. They can restore degraded soils, reduce carbon emissions, and support biodiversity. For farmers, they offer a pathway to diversify income and build resilience. But these benefits remain locked behind a cycle of under-investment, fragmented effort, and policy neglect.

Today, the fava bean sits as a minor crop, constrained by low yields, unpredictable quality, underexplored processing, and insufficient market demand. This vicious cycle can be broken, but only through deliberate, synchronised action. The roadmap outlined in this document charts a clear path forward, grounded in seven strategic outcomes and backed by concrete policy mechanisms. It is a blueprint for transforming the entire sector simultaneously. It does this by strengthening breeding and agronomic guidance through Horizon Europe, enabling farmers to start and sustain the cultivation of protein crops through CAP transition payments and coupled income support, building processing infrastructure through competitiveness funds, and pulling demand through public procurement directives and dietary guidelines.

Success requires coordinated action across the entire value chain: from breeders and input companies to farmers, processors, retailers, and public institutions. On top of the role of the EU, Member States, and regional and local governments in establishing this enabling framework, the entire value chain must act. Input companies and breeders must invest in varieties tailored to fava beans' potential. Farmers, by organising into producer organisations, can strengthen their bargaining position and share knowledge, equipment, and processing costs. Processors must build infrastructure and secure reliable offtake, while retailers must commit to featuring local, sustainable legumes and updating sourcing practices. The private sector must continue the collaborative spirit demonstrated throughout this roadmap's development, translating policy into action.

The benefits of success are profound and shared across a competitive, thriving sector. Farmers will have profitable, de-risked opportunities to diversify and strengthen their businesses. Rural communities will see new investment, jobs, and value creation flowing locally. Food manufacturers and processors will access reliable European protein that meets rising consumer demand for transparency and sustainability. Consumers will have healthier, more affordable, and more delicious options that support their wellbeing. And Europe will reclaim strategic autonomy: no longer vulnerable to distant geographies, volatile import markets, or supply chain vulnerabilities.

The time to act is now. The policies are within reach, the market appetite is growing, the science is solid, and farmers across the EU are already demonstrating that fava beans can be profitable and regenerative. What is required is the collective will to make legume production and consumption not a fringe priority but a cornerstone of a reimagined, resilient, and equitable European food system. With coordinated support, fava beans and other legumes can transform from a symbol of our agricultural past into architects of a healthier, more secure, and more sustainable future: the European legume renaissance.

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Appendix

This appendix lists experts with whom interviews were held to gain insights on the development of this sectoral roadmap. Note that the organisations below have not committed to endorsing the content of this report, but their individual views were considered by The Protein Project in the report's development.

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Birdlife

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European Alliance for Plant-based Foods

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Stig Andersen
ProFaba

Thomas Truyen
Limagrain

Wouter Kohlen
Wagenignen University & Research

Methodology behind the model used to reach the impact quantification results outlined in section 4

The information below summarises how the RegenAgIQ model evaluates the economic implications of integrating fava into crop rotations.

Model input data

The following data sources and assumptions are used to reflect realistic farm conditions:

- **Data categories:** The model uses data on allocated overheads, operating costs, crop prices, yields, and farm archetypes to reflect realistic farming conditions.
- **Data sources:** Cost and price information are drawn from case studies in Germany, France, and Poland as well as the Farm Accountancy Data Network (FADN) and expert interviews, while yield estimates are sourced from Yieldgapmap (25).
- **Subsidies:** The model incorporates CAP subsidy data from main fava-producing countries (Germany, France, Poland) to capture the effects of the Common Agricultural Policy.
- **Additional assumptions:** The model applies additional assumptions on farm size, the nitrogen fixation potential of fava, and expected impacts of interventions on yields, costs, and prices.

Model logic

The model simulates crop rotations and intervention scenarios to estimate how fava affects farm performance:

- **Rotations:** The model simulates multi-year crop rotations for sequences without (wheat, barley, oilseed rape, wheat, maize, oilseed rape) and with fava (wheat, barley, oilseed rape, wheat, maize, fava) to understand comparative performance. In line with realistic farm practices, the model assumes that at a given time all the crops in a 6-crop rotation are grown on 1/6th of the farm (except in the case of fresh fava beans, where 20% of the farm is assumed to integrate fava into the rotation).
- **Archetypes:** It applies cost and price structures that differ across farm archetypes to reflect operational and geographic diversity. We identified three farm archetypes:
  - Archetype 1 – Large Arable Farms in Western Europe
    This archetype represents intensive cereal growers incorporating fava beans as a rotational break crop. This type of farming has high mechanisation and yield potential, and sells fava as a commodity. We set the modelling farm size set at 100ha.
  - Archetype 2 – Large Arable Farms in Eastern Europe
    This archetype has the same farming objectives, rotations and size as Archetype 1, but characterised by lower costs and prices. Combined with Archetype 1, this archetype represents most fava hectares in the EU. We geographically defined Eastern Europe as countries east of Austria (see Annex).
  - Archetype 3 – Mixed Crop-Livestock Farms
    This archetype represents medium-scale diversified farms that grow fava beans as on-farm pig feed. The model focuses on cost savings from replacing bought wheat and soy meal by fava in pig feed. This archetype is mainly found in mixed landscapes in e.g. France, Germany, Poland, Ireland, Austria, Spain and Italy. The modelling farm size is set at 50ha.

- **Scenarios:** A range of pricing and intervention scenarios are evaluated to show how different conditions influence outcomes. Specifically, we compare a “business as usual” scenario from today until 2040, with a scenario that includes the seven interventions recommended in the Roadmap. We then further distinguish by fava usage type: as dry food for humans, as fresh food for humans, and as dry feed for pigs.

Model outputs

The model generates the following outputs to illustrate the profitability effects of adding fava:

- **Farm profitability:** The model calculates net farm income for each archetype and scenario to compare overall profitability and show the effect of introducing fava to rotations.
- **Crop margins:** Crop contributions to total income are visualised under varying yield and pricing assumptions.
- **Subsidy effects:** It highlights the role of CAP subsidies in shaping farm-level outcomes.
- **Intervention impacts:** The model shows how interventions alter crop margins and total farm profitability.
- **User input:** Users can adjust key assumptions through the model interface to test sensitivities.

Additional graphs

Figure 25: Evolution of cashflow for 100ha Eastern European arable farm (Archetype 2)

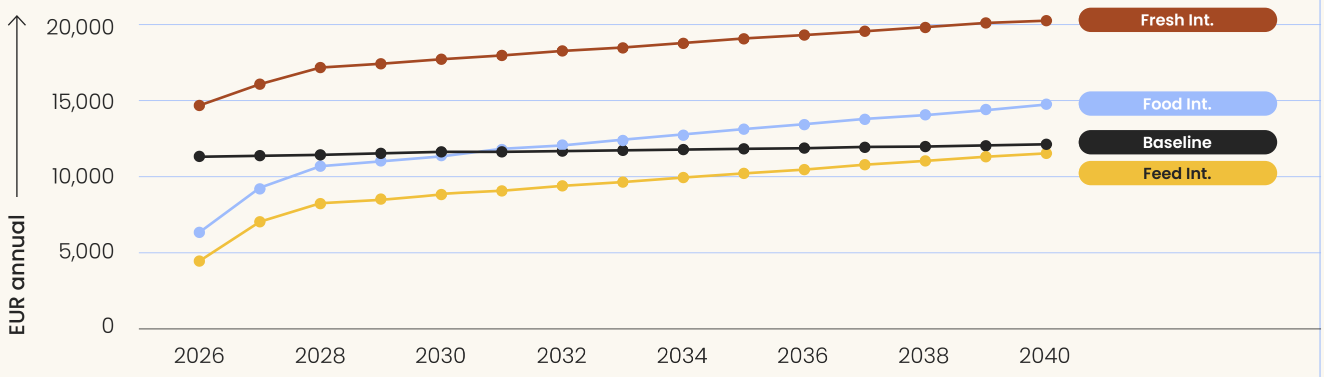
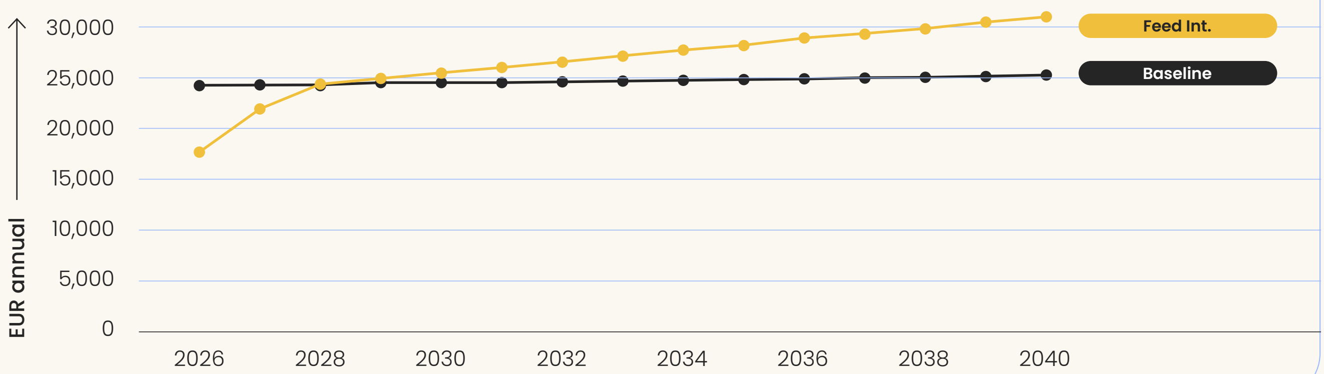


Figure 26: Evolution of cashflow for a 50ha Mixed Crop-Livestock farm (Archetype 3)



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Beyond the gridlock, a new protein path.

In a world that tries to force us into siloes, we choose a different way.

We believe the best solutions bring together everyone's strengths.

The wisdom of farmers.

The foresight of Europe's brightest minds.

The abundance unlocked by new technologies.

We see a future where farmers thrive, consumers enjoy better food, businesses grow responsibly, and our planet heals.

This future is only possible when we transcend the boundaries that have kept us apart.

That's why we bring together voices that rarely share the same table.

We prefer uncomfortable coalitions over partisanship.

Pragmatic steps over waiting for perfection.

Grounded research over wishful thinking.

And we start from what's possible, instead of what's wrong.

Because the challenges we face are too important for half-measures and because the opportunities ahead are too valuable to miss.

Bridging divides, building futures.

The Protein Project

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